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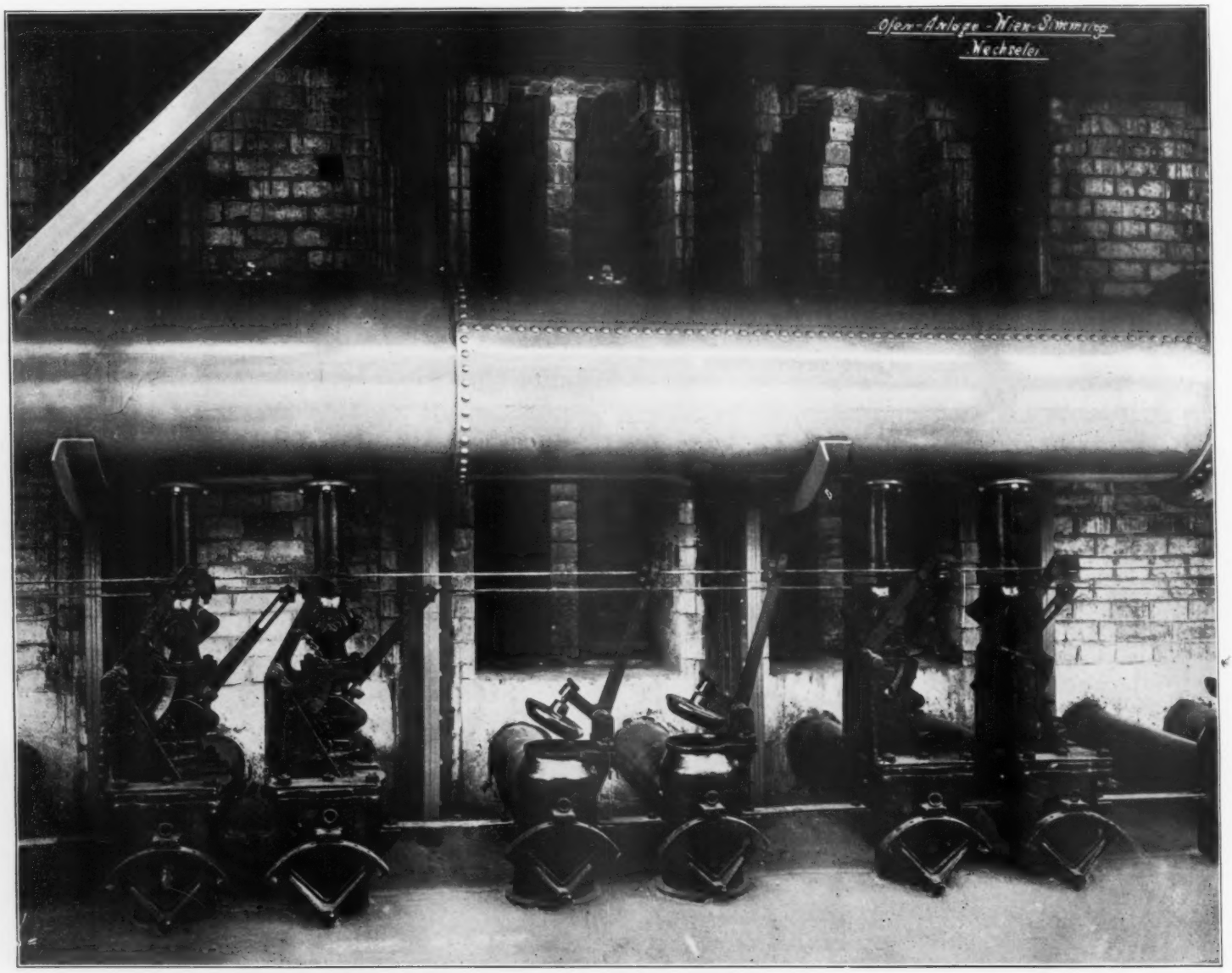

KOPPERS REGENERATORS—GAS PLANT AT VIENNA.

H. KOPPERS COMPANY,

CONSTRUCTORS OF HORIZONTAL CROSS-REGENERATIVE COKE AND GAS OVENS,

5 S. Wabash Avenue, - - - CHICAGO, ILLINOIS.

THE AMERICAN
GAS LIGHT JOURNAL

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Recent Improvements in Gas Heating.

[By a "MANCHESTER MAN."]

In several large European towns severe competition over the lighting of the streets by means of gas and electricity has resulted in remarkable improvements being introduced into the former system within recent years. When electrical lighting became general, and large generating and power stations were erected, it was generally thought that gas lighting was doomed, that it was only a question of time for it to be superseded, as it had three generations ago driven out oil lighting. Gas engineers set to work, introduced new systems of gas lighting giving brilliant and unexpected results, which have stood experimental tests and gas street lighting is now driving out electrical lighting. The results seen, say in the central thoroughfares of the city of Manchester, are so vastly superior to electrical lighting, in that it is perfectly easy to prophesy, that the improved gas lighting will in a few years entirely drive out electrical street lighting, unless in turn unexpected improvements in electrical lighting can be invented.

With these improvements in the use of gas for lighting prominently in public view, it is only reasonable to expect that corresponding progress would be made in the application of gas for heating purposes and an important step forward has recently been made.

Two professors of Leeds University have for some time been engaged on experiments having for their object improvements in heating by gas, and it has recently been announced that they have achieved complete success in overcoming some of the practical difficulties that have hitherto retarded the application of what is known as flameless or surface combustion of gas for industrial and metallurgical purposes. There can be little doubt that this announcement is of considerable importance, as it is stated, on the strength of prolonged tests, that thermal efficiencies of 90 per cent. to 95 per cent. can be obtained by the new method in gas heated furnaces and steam boilers. American readers will readily appreciate the statement that if all the advantages clamed for the new system of gas heating can be substantiated in practice, a new era of progress, comparable only to that created by the introduction of the incandescent mantle, will have been inaugurated in the gas heating industry.

It is both interesting and important to note that the recent improvements are applicable to all descriptions of combustible gases, including even the waste gases from coke ovens and blast furnaces, which in many cases have been allowed for years to run to waste. The possibilities in view from the recently made improvements may be gauged from the following results obtained by gas heating:

1. A charge of cast iron has been melted in a crucible suitably jacketed with refractory material, within 10 minutes from the time of charging the cold scrap.

2. Carborundum, an electric furnace product containing silicon and carbon, and a highly refractory compound, has been decomposed into carbon dioxide and silica in the new gas furnaces, from which it is obvious that a temperature of approximately 2,000° C. can be attained if desired.

3. A model steam boiler, with 10 fire tubes only 3 feet in length, provided with a tube economizer with tubes 1 foot in length, has been made to burn 1,000 cubic feet of gas per hour and to yield steam at 100 pounds pressure with a working efficiency of 94.3 per cent., or a net efficiency of 90.3 per cent., after deducting the power required to drive the compressor, which as described below is required to produce the necessary gas mixture. This represents an evaporative result of 20 pounds of steam per square foot of heating surface per hour.

The theory on which this new gas appliance is based, is derived from the fact that a combustible gas, when mixed with a given quantity of air and burnt under conditions, which have been experimentally ascertained, is consumed without the formation of flame. This fundamental fact was established about a century ago by the well-known English chemist, Sir Humphrey Davy, and is well known as a laboratory and lecture experiment. The thermal efficiency of gas burnt in this manner is extremely high, but there have been difficulties in its practical application, which have hitherto made its application for industrial and metallurgical purposes impossible. The difficulties have now been overcome after 2 years of investigation, experiment and the testing of various materials. It is well known that a mixture of gas and air, in the proportions which are required for combustion on this principle, forms an explosive mixture, and that constituted the essential difficulty which had to be dealt with in order to make this system of heating available for practical purposes. Special methods and devices have been worked out to prevent "backfiring," in other words, to make explosion impossible by cutting off the flame from the gasholder. Special materials were also necessary, as the temperatures reached in a gas furnace of the new type are so much in excess of those produced under ordinary conditions in gas stoves or heaters. The materials usually employed for crucibles and muffles in gas furnaces of the usual type

are quite unable to resist the higher temperatures of the improved type of gas furnaces. Therefore, new material of exceptional refractory powers had to be searched for and one has been found, which acts as an "incandescent porous solid," on the surface of which the "flameless combustion takes place." All difficulties have given way to perseverance, and crucible and muffle furnaces have been made and tested, as well as a small steam boiler, in which the new system of applying gas for heating purposes has given the results theoretically expected.

In its simplest form the new appliance consists of a porous diaphragm, made of refractory material, suitably connected to a gas mixing chamber of special design. The gas mixture enters this chamber under high pressure, which makes the forward movement of the gas greater than that of the propagation of the explosion wave through the gas mixture. Under these conditions the gas mixture burns without flame as it impinges upon the surface of the incandescent diaphragm. The following results are obtained: The combustion is completed within ½ inch thickness of the diaphragm surface, and as there is no unburned, or half burned gas, the combustion is perfect; finally an intense heat is obtained within a very small area. The diaphragm is maintained in an intense state of incandescence, without the presence of any visible flame as long as the gas supply is continued. A strong source of radiant heat is, therefore, now available, which can be applied in any desired position for innumerable industrial purposes.

The refractory material, the key of the invention, is broken up, graded into lumps of suitable size, and then packed with great care around a crucible or muffle, or within the tubes of a multitubular boiler. The gas mixture, containing air in a carefully ascertained proportion, is forced into the layer of refractory material by a rotary blower, and complete combustion of the mixture without flame results, rendering the refractory material incandescent. Fireclay plugs, with a central hole ¾ inch diameter, are used in the steam boiler, for the double purpose of keeping the front of the boiler cool, and of providing a suitable aperture through which to force the gas mixture.

The only results obtained at all approaching those of the new gas heaters, are those yielded by the Siemens regenerative gas furnaces, which are constructed in large units and are extremely costly, both to build and maintain. The efficiency of gas-fired boilers working under normal conditions varies from 50 to 70 per cent., with an evaporative result ranging from 7 to 10 pounds of steam per square foot of heating surface per hour. The recently perfected invention yields double this result for each square foot of heating surface with 25 per cent. higher thermal efficiency. When the new system has stood the test of practical application on a large scale for some years, a most useful and compact gas heater will be available, which may develop a market and field of its own, as well as compete with existing appliances.

Gas as an Illuminant.

[Lecture delivered by Mr. VAN RENSSELAER LANSINGH, Centenary Celebration, Franklin Institute, Phila., Pa., April, 1912.]

[This lecture was divided into two parts, devoted respectively to the historical division of the subject, and to its present standing. In view of the fact that the first division has been minutely reviewed by the preceding lecturers, the greater portion of the Lansingh retrospect is unpublished.—EDS.]

* * * *Burners.*—The first burner as used by Murdock consisted of a small iron tube open at the end. It was very evident, however, that this was both wasteful and smoky, and for it he substituted a closed tube, in which were bored 3 small holes, giving 3 divergent jets. This, due to its shape, was called a cockspur burner. It gave less than 1-candle power per cubic foot of gas. This, however, was soon followed by the batswing burner, consisting of a thin slot in a convex tip, giving a broad, but not high, flame. In 1820 the fishtail burner was invented by Neilson, of Glasgow. This consisted of a concave tip in which were bored 2 holes at angles of about 45°, so that the streams of gas issuing from these holes impinged on each other, forming a flat flame, much less broad than the batswing, but considerably higher. When used with inclosing glassware this was found much less likely to crack the same. Both of these forms of burners are in common use to-day. The fishtail burner, however, is not as efficient as the batswing, unless used with extremely rich gas. The tips used on flat flame burners were made of iron, but, owing to their high conductivity, they lowered the temperature of the burner and consequently were abandoned and replaced by lava or other forms of heat resisting, non-conducting material.

In the earliest days of gas lighting, the Argand burner, adapted for the use of gas, was standard. This burner was essentially the same as that used for oil, with the exception that no wick was supplied and that at the top there was a thin plate, perforated with a large number of holes, through which the gas issued, the different flames uniting to form one cylindrical flame. The Argand burner was for a long while the standard burner; but its drawbacks, due to its first cost, difficulty in keeping the glassware clean, and the fact that it was extremely sensitive to draughts, and had to be regulated as to the correct amount of air admitted, prevented its universal adoption. Although more efficient than the ordinary flat flame, it was superseded by this type in most places. In this connection it is interesting to note that, as late as 1819, when Peckstone's *Gas Lighting* was published, that meters had not been introduced and that the method of charging was on the flat rate, which in London was £3 per year for an Argand burner, burning from sunset to 9 o'clock at night; £4 per year from sunset to 10 o'clock, etc. This was, according to meter rates, about $3.75 per 1,000, but the rate was actually less than this, owing to the fact that there was no guarantee that the customers turned the lights out at the hour agreed upon; and, furthermore, the adjustment of the burners was such that generally much more gas was used than should have been. The first meter was invented in 1815, but it was not for a good many years afterward that their use became universal. The standard meter as ordinarily used to-day was not invented until 1843.

In 1853, Sir Edwin Franklin invented the regenerative burner, which is essentially an Argand burner, in which the products of combustion are used to heat both the gas and air supply to the burner. This preheating of the air and gas allowed a high temperature to be obtained, and, inasmuch as the light depends upon the temperature of the carbon particles, a much higher efficiency was obtained by this method. Siemens, in 1879, improved on this, and his type of burner is still in use in certain places, although rapidly being replaced by the inverted mantle burner. It had numerous drawbacks, chief of which was the large size of the units. It was also costly to install, and, with the exception of use in lighting large spaces, was never widely introduced.

Up to the time of the introduction of the Welsbach mantle we find the following efficiencies of the different types of burners qn coal gas of 16-candle power:

Flat flame	from 0.6 to 2.5
Argand	from 2.75 to 3.2
Regenerator	from 7.0 to 10.0

The regenerator burner could be forced to considerably higher efficiency than this were it not for the inability of the parts composing the lamp to withstand the intense heat. It is to be noted that the Argand burner was the standard used for testing the candle power of gas, and that gas was supposed to give 16-candle power with the proper Argand burner for every 5 cubic feet of gas consumed. It is from this London standard that we get the standard 16-candle power lamp as used in electric lighting.

Mantle Burners.—The entire gas lighting industry was revolutionized in the invention of mantle burners, by Dr. Auer von Welsbach, in 1885. It is interesting to note, however, that many attempts along the same lines had been previously made before that time. In 1826 Gurney employed a cylinder of lime on which he played an oxy-hydrogen flame. This never proved a commercial success, although an attempt was made to use a modified form in Paris with oxy-coal gas. Gaillard (1848) made a mantle of platinum gauze, but due to erosion, caused by the gases, its life was short and the plan was never commercially put into practice. The next step was that taken by Bunsen in 1855, who produced the well known, non-luminous flame by mixing coal gas and air before ignition. Claymond (1882) devised a basket or cone of threads of calcium magnesia, supported by a platinum wire cage, and, by means of a blowpipe and Bunsen burner, heated the same to high incandescence.

In 1885 Welsbach was working on the composition of rare earths as shown by the spectroscope. In order to make them more easy for examination than by placing them on the usual platinum wire, he immersed cotton in a solution of the metallic salts, which, after being burned, gave a replica of the thread, composed of the oxide of the metal, and glowed brightly in the flame. This led immediately to a study of the possibilities of using this process for lighting. Many

different kinds of rare earths were tried, but it was finally determined that the most satisfactory combination was that of 99 per cent. thorium and 1 per cent. cerium, which is the standard in use at the present time. It is interesting to note in this connection that, if the percentage of cerium is either increased or decreased, the decrease in the candle power is very marked. If, for example, the cerium be increased to 5 per cent., the candle power is less than ½ what it is at 1 per cent., while if 10 per cent. of cerium be used, the candle power has fallen to about 20 per cent.

In a paper of this length it is needless to review the further history of the development of mantle burners, except to state that the inverted burner, as we now know it, was first introduced in the years 1900 to 1901, but was not perfected so that it came into popular use until several years afterward.

Modern Gas Lighting.

Flat Flame Burners.—Flat flame burners are rapidly going out of use, except in special instances, where the light is used more for a marker than for the amount of illumination given off, or where the burner is subject to such hard usage as to render the employment of a mantle burner inadvisable. It is to be noted that the rating of flat flame burner tips, as ordinarily sold on the American market, is of little value, as many instances are found where a tip rated as using 1 cubic foot of gas per hour gave as high a candle power as a 4-foot tip, with no greater amount of gas consumption.

The flame from an open gas burner appears practically transparent to light, as the horizontal distribution curve of such a flame is practically uniform. This is also true of the vertical illumination curve, with the exception of the slight shadow cast by the tip. In other words, the horizontal candle power, as ordinarily measured, whether in a plane with that of the flame or at right angles to it, practically measures the mean spherical candle power of such a unit.

Burners of this type are generally used with some form of globe to protect them from draughts. The effect of such glassware is usually to throw considerable light upward, so that where the light is wanted below the horizontal a burner of this type is inefficient as ordinarily employed. The Argand burner is but seldom used to-day, except for testing the quality of gas, so that we need not here consider its characteristics.

Upright Mantle Burners.—Upright mantle burners have been greatly developed since their first introduction in 1886. In the early days there was a decidedly greenish tinge to the light, and even to-day in most of the mantles this greenish tinge is quite noticeable, especially in comparison with other sources of light. This has, however, been more or less rectified, and it is possible to-day to buy mantles on the market which have considerable variation in color. One of the drawbacks to the mantle burner has been that until recently only one size of mantle was available, namely, a mantle about 3½ inches high, giving a rated horizontal candle power of from 60 to 80. At the present time, however, a smaller mantle is available, so that it is possible to get a wider variation. This has been one of the chief drawbacks of gas lighting as compared with electric lighting; namely, the lack of different sized lamps. Efforts to overcome these objections seem to be making progress in both upright and inverted burners, and it is likely that in the near future this advantage of electricity will be largely done away with.

An important point in gas lighting, especially with mantle burners, is the effect of pressure and also quality of gas on the light. Gas lighting would be much improved were burners selected with reference to this point, the same as electric lamps are selected for different electrical pressures in various districts. The modern electric central station measures the voltage pressure at different parts of its circuits and buys its lamps accordingly, thereby furnishing proper lamps to the customer. In this way a great deal of complaint as regards poor service, etc., is done away with. If the gas companies followed the same plan they would undoubtedly have a much better satisfied class of customers, which is the best asset a gas company could have. Moreover, in this connection it is interesting to note that mantle burners are seldom or ever bought on specifications. When the electric light company furnishes lamps to its customers it is only after the lamps have been bought on rigid specifications, and have actually been tested to find out whether or not they comply with the requirements. In gas lighting, however, it is the usual policy of the gas company to furnish to its customers mantles and burners at all prices and grades, leaving the customer to select whatever in his opinion he sees fit to buy. The result is that the poorest and cheapest burners and mantles are most often found on the gas company's mains, resulting in the dissatisfaction of the customer and making him comparatively ready to change to electric lighting when opportunity offers. It would seem that, if the gas companies are to retain their customers for lighting purposes, it is necessary to take some step along this line, as, with the introduction of the tungsten filament lamp, the mantle burner—especially under poor operating conditions—can no longer hope to compete as successfully as in the past.

With the upright mantle burner the distribution of light is considerably different from that of the open flame burner, which, as we have already seen, gives practically spherical distribution. The upright mantle burner gives its maximum light on the horizontal and comparatively little light directly underneath. Practically ⅓ the light is above the horizontal and ⅔ below. From the standpoint, therefore, of ordinary lighting, it is desirable to change its distribution. The ordinary shades as used with the mantle burner often accomplish their purpose of diffusion more or less successfully, but fail to redirect the light in directions below the horizontal. As a matter of fact most upright burners, when equipped with diffusing glassware, throw two-thirds of their light above the horizontal, and unless the walls and ceiling be extremely light, a large amount of flux is lost. No distribution curves are given in this paper, as such are easily available elsewhere, in articles mentioned later. The thing to notice at this point is that the upright mantle burner is, generally speaking, not well adapted to utilize most of the light.

Inverted Mantle Burners.—Lamps should be rated in terms of their total flux rather than their mean horizontal candle power, if we are to obtain comparative figures. From an illumination standpoint the important things about a lamp are: The total quantity of light given out and the distribution of the same. The importance of this was not realized in the gas world until the introduction of the inverted burner. The standard inverted burner gives about 67 per cent. of its light below the horizontal and 33 per cent. above. This should be compared with the standard upright burner, which gives 55 per cent. above and 45 per cent. below. This means for the same total flux of light an increase of nearly 50 per cent. in the light below the horizontal, which, if this is taken as the useful light (as is often the case, but not by any means always), marks a great increase. Moreover, any glassware which is used with inverted burners is apt to increase rather than decrease the flux below the horizontal, especially if the glassware is of the open type; so that at the very start we have a marked increase in the net efficiency of the inverted as compared with the upright burner. In addition to this, the burner itself is slightly more efficient. Owing, furthermore, the the fact that the inverted burner lends itself more easily to artistic uses and is less likely to blacken the ceiling, as it can be placed lower, its introduction and use have been very rapid. With the introduction of this type many new kinds of glassware have been devised for it. Among these may be mentioned those of the prismatic type which are now available with the standard inverted mantle burner so as to give the three typical distribution curves (extensive, intensive and focusing) which are found to fit the requirements of so many installations. The difficulty of breakage in connection with the use of pressed glassware has been largely obviated by the use of a metal collar. We can, therefore, safely state that, with the improvements which have already been made it is possible, with gas, to duplicate nearly all of the effects which can be obtained with electric lighting, both as regards ornamentation, distribution, ease of control, etc., and even surpass it in cheapness of operation.

Gas Arc Lighting.—The gas arc has been an attempt to obtain a large unit of high candle power where a large flux of light is wanted. Owing to the size of the unit it has generally been thought to be highly efficient; but, due to causes which it is not necessary to name here, it may be stated that the gas arc is no more efficient—if as much so—than the individual burner. We can, therefore, consider a gas arc to be nothing more or less than a large upright or inverted burner, and most of the remarks which have already been made as regards these two types can equally well be applied to the gas arc.

Diffusion.—One of the most important considerations in connection with mantle burner lighting is that of diffusion. When our only forms of burners were those of the Argand or open flame type, the necessity of diffusion was not great, as the candle power per square inch was not in excess of five. With the introduction, however, of the mantle burner, with an intensity of many times this, and in addition a much larger quantity of light, it became necessary not only to shield the eye, in order to protect it from harm, but also so that the eye could be able to work with a wider pupilary aperture, and thus be able to see better. It is recognized now as one of the funda-

mental principles of good lighting that the light must be well diffused, and it is interesting to note that the passing of the bare mantle burner is becoming exceedingly rapid.

High Pressure Gas Lighting.—The ordinary pressures as used in gas lighting are from ½ inch at the burner up to perhaps 2 inches. Flat flame burners work best on comparatively low pressures, but with the mantle burner higher pressures are more suitable. It was soon found that an increase in light could be obtained by using higher pressures. For street lighting, therefore, it was logical that experiments should be made along these lines. The result has been the introduction of high pressure gas burners principally for street lighting. With the ordinary low pressure in either the inverted or upright burner the candle power per cubic foot is in the neighborhood of 20, whereas with high pressure this can be increased 2 to 2½ times. High pressure is adapted for either upright or inverted lighting; but, owing to the superior distribution obtained with the inverted type, this is rapidly supplanting the upright type. One of the most notable installations of this kind is in Berlin, where lamps rated at 4,000 candle power are employed, consisting of 3 mantles operating at a pressure of 50 to 60 inches of water, and consuming about 25 cubic feet of gas per mantle, or 75 to 80 cubic feet per hour. It is interesting to note that the curve of distribution in the high pressure burner is somewhat flatter than in the ordinary inverted low pressure burner, a point particularly well adapted for street lighting.

Conditions being considerably different in this country from those abroad, it has not been adopted to any extent here, although it is likely to have a much wider use than at present. Owing to the extreme intensity of the mantle it would seem necessary to adopt some means for diffusion, and although this is not as important in street lighting as in indoor work, it undoubtedly will soon become one of the first requirements.

Heat Considerations—The scope of this paper will not allow us to consider this question in detail, but it is sufficient to call attention to the fact that, while more heat is liberated from the production of light by gas than by electricity, it seems to be the concensus of opinion of those who have thoroughly studied the subject, that such heat is useful in producing a ventilation which would be otherwise unattainable, and the products of combustion are carried off by this means, so that the quality of the air in a room is at least equal to that when other forms of lighting are used.

Methods of Gas Ignition—The ordinary method of lighting gas is by striking a match, but owing to the inconvenience many different schemes have been adopted. The most common of these is the pilot light, consisting of a by-pass which allows a small quantity of gas to pass around the burner. This pilot light burns continually and, whenever the main supply of gas is turned on, lights the mantle. The gas can be turned on either by turning the gas cock by hand or else by a pneumatic valve control. In this latter case a very small pipe is run to any convenient point, and at the end is attached a pneumatic plunger. When this is pushed in, air is forced through the pipe and turns the main valve in the gas supply pipe. In order to turn the light off, the plunger on the wall is pulled out, resulting in the valve in the gas supply pipe being thrown the other way. When properly installed the pneumatic control system is well adapted for this purpose and does for the gas what the electric switch does for electricity.

Another method of ignition is that by the jump-spark system, which has been in use for many years. By this system when a button on the wall is pressed the gas is turned on and at like time a spark ignites the same. The latest form of this is self-contained in the fixture.

Still another method of ingition is by a catalytic process. Advantage is taken of the well known quality of platinum sponge to occlude gases. This is placed on the mantle and when the gas is turned on the platinum sponge begins to glow and rises to a sufficient temperature to ignite the gas. Many efforts have been made to introduce this form commercially, but up to the present time not very successfully. Other chemical means have been introduced, such as an iron-ceria compound, but it is too early yet to state how successful this will be for this purpose.

General—To one familiar with what has been accomplished in this field one of the most astonishing things in the gas situation is the lack of standardization. It is true that a good deal has been accomplished along this line within the last year or so, but there is still much to be desired. The writer would suggest some of the following steps to obtain improvements in gas lighting:

1. Greater range in the size of the units to better meet the requirements of all classes of light, both in upright and inverted burners.
2. More reliable methods of commercially rating gas lamps so that, when specifications are drawn up by the illuminating engineer or the architect giving certain definite illumination requirements, he can be reasonably sure of obtaining exactly what he wishes.
3. The lamp should be standardized similarly to the present methods of standardization of electric incandescent lamps.
4. Holders or fitters should be changed to conform to electric practice. Thus the gas fitter is 3⅜ inches in diameter; whereas the standard electric is 3¼ inches; 2½-inch holders are common to both gas and electric!

In a paper of this length it is impossible to more than very briefly sketch the historical and present state of the art. Lately much has been published on this subject and the writer would refer to the excellent papers on "Gas Lighting," appearing in the Johns Hopkins Lecture course of the Illuminating Engineering Society, Volumes 1 and 2. For different forms of photometric curves, for both upright and inverted burners, reference is made to "Practical Illumination," by Cravath and Lansingh. A complete bibliography of the subject is to be found in the lectures on "Gas Lighting" in the Johns Hopkins Lecture Course referred to above.

[Continued from Vol. XCVI., p. 437.]

PROCEEDINGS OF THE EIGHTH ANNUAL MEETING, ILLINOIS GAS ASSOCIATION.

Held in the Auditorium Hotel, Chicago, March 20 and 21, 1912.

Second Day—Morning Session.

The President—Next in order this morning is the paper by Mr. William I. Battin (Lafayette, Ind.) entitled:

TWO POUNDS PRESSURE AT THE TIP: WHY NOT?

How is it that gas has so long been distributed at a pressure less than one can easily blow with his breath? The writer judges the real reason is found in the fact that, soon after gas was first discovered, it became necessary to provide a storage vessel for it, and the beautiful principle of the gasholder was evolved. Now it happened, no doubt, that the pressure thrown by these first holders was just a couple of inches; and the distribution of gas, thus started, was continued under these conditions.

If, on the other hand, those first few feet of gas had been compressed into a storage tank under high pressure, the whole history of gas distribution might have been changed; and probably the enormous amount of gas which has been wasted through actual leakage from low pressure mains would have been considerably reduced, because it would soon have become evident that pipes could be constructed that would be practically bottle tight, whereas we all know how far from tight the old, lead-jointed gas pipes have been, no matter how often they are overhauled.

The purpose of this paper is not to advocate high pressure in the usual sense, although this form of distribution is so far developed that no one any longer questions its desirability in many cases, but rather to suggest simply that the pressure on the regular mains and services and meters and house piping be increased to 2 pounds.

The idea is not original. It was first suggested to the writer years ago by our good ex-President, Mr. Rice, who is certainly a capable authority on such matters; and while he may not have intended it to be taken seriously, the writer did take the matter seriously and herewith presents it, not as the result of an actual try-out, but merely as a plan that looks feasible, and in the hope that your discussion will bring out weaknesses he has overlooked before it is actually put to a practical test in town distribution.

To answer the criticisms which will no doubt be made, the writer will state it is his opinion that so-called leakage is, in properly constructed systems, largely not leakage at all, but only the shrinkage that occurs when the gas is first sent out from the works and cooled and scrubbed in, say, the first mile of travel through the mains, and which shrinkage is not cared for by the regular corrections for temperature and barometer.

Proof: (1) The loss in a practically bottle-tight, long distance 6-inch high pressure main, on a given amount of gas, measured to the compressor by a station meter, was practically the same, when measured

out again by a station meter 1¼ miles from the works as when measured at a station meter 16 miles from the works.

(2) Those towns in which the gas is made and distributed in the same town have a high leakage (figured in all cases on the equivalent leakage per mile of 3 inch main per year); those where the gas is fed from high pressure lines have a low leakage, whether the gas is fed direct from the high pressure mains or into holders and out again: the high pressure line-loss, however, it is admitted, being sufficiently high to make the combined leakage somewhat in excess of what it would be when the gas is made and distributed in the same town. All measurements are made by standard station meters, but in this connection the writer would state that none of the thermometers used have been found to really give the temperature of the gas in the pipe; the reading, even in the case of the high priced instruments, being somewhere between that of the gas and that of the pipe itself, the pipe being affected by the surrounding air temperature or by radiant heat from steam radiators, etc.; and, inasmuch as temperature is such a vital factor in gas measurements, the actual percentage of loss is difficult to arrive at.

As far as real leakage is concerned, the writer has made tests and computations, based on the send-out when there is very little consumption, viz.: From 1:30 A. M. to 3:30 A. M. in a dozen cities, and has found that those towns which have the old natural gas screw pipe have much less leakage than those having lead jointed bell and spigot pipe.

Now these natural gas lines were laid very shallow—often just barely covered—and you might say carelessly; that is, from an artificial standpoint, as far as grade and alignment were concerned, but always with a view of being tight; and now, after 20 years of use, they serve the purpose of distributing artificial gas admirably. Why? Because they are tight enough so that surface water seldom leaks in, and, with the exception of the immediate vicinity of the gasholders, the gas does not drop enough water to trap them off. Practically no water is pumped from the few drips that were put in where it was assumed the low places might be.

In this connection, too, 2 pounds pressure will at all times prevent leakage-in of water, even though the pipe is not tight, and if the gas is, you might say, dried out in the first mile of travel, very little trouble will be experienced except from frost and exposed services, house risers, etc. And even this trouble the writer believes, can perhaps be done away with, if, after traveling this first mile upon leaving the holder, the gas is passed through a huge radiator exposed to the atmosphere, shaded from the sun, so that in that radiator the gas will be cooled down in the coldest weather to as low a point as it will reach even in exposed services or house risers. Having dropped its moisture in the form of frost in this radiator, and there being no moisture in the pipe further on for it to pick up, the gas will not again freeze in the service pipes.

We, therefore, can lay our pipes at little expense, especially since they can be quite small pipes, and can be put inside of the curb or under gutters, as in strictly high pressure distribution. It may be necessary to use valves for making repairs or changes in lines, but as nearly all the lines will be small, it is possible that stoppers could be used for shutting off the gas—at least as far as stopping the flow is concerned—although it might be difficult to insert a stopper. However, when one considers the enormous pressure under which repairs of breaks on large natural gas lines are made, he realizes that the asphyxiating effects of artificial gas would be the only thing to fear, not the pressure.

Now what effect will 2 pounds pressure have on the meters? Many tests have been made which show that meters will stand even up to 10 pounds, and 2 pounds does a little more than straighten out the tin when the pressure is first put on. The house piping, we will admit, ought to stand, say, 5 pounds pressure; in fact, our inspectors will not pass it if it does not.

So, finally, we come to the fixtures. Here we do fall down, because there are few fixtures made that will not leak under 2 pounds pressure. But it is the same fixtures that, after a short time, leak anyway, because they depend on the grease holding the plug tight with the result that the grease works out and the fixtures leak—too little perhaps to find it with soap suds, but yet enough to cause people to say "Oh, I don't want gas light in my house; every place where you go where they have gas, you can smell it." And, gentlemen, who even amongst ourselves lives in a house where there are really tight fixtures? The latter can be made tight at little additional expense; in fact, one line of fixtures the writer had occasion to test did test out tight, and apparently remain tight when in use.

A thing that will seem peculiar about using 2 pounds pressure is that it is as easy to turn an ordinary fixture cock down so as to burn a tiny blue flame as it is to do it with 2 inches pressure, or to make any other adjustment for small flow, for that matter. However, for the full, open flow on flat-flame burners, or other burners in use to-day, it would be necessary to provide a so-called "pressure breaker" to prevent more than, say, 10 feet of gas per hour passing under 2 pounds pressure. This is simply a little male and female burner nipple, ¾-inch long, with a small hole bored through it, and preferably with a little screen and wad of cotton for a filter. Of course, all stoves have adjustments which will easily take care of higher pressures. What would be the advantage of using 2 pounds pressure?

(1) Small pipes could be used.
(2) They could be laid in an inexpensive way.
(3) They would, therefore, be easy to get at to repair.
(4) The trouble from moisture in the gas could be reduced.
(5) No regulators would be necessary on the house services.
(6) Smaller house piping could be used, thus cutting down installation costs, and there are instances where regular house piping is not feasible at present where, with 2 pounds pressure available, small bent tubes could be used, as in the case of pressure gasoline systems.
(7) Ordinary exhausters could be used to pump the gas where necessary.
(8) There would be practically no increased hazard.
(9) Every advantage of high pressure would be available to every customer without using an individual compressor in each case.

Before going into the latter point, let us consider a little further the matter of first cost for mains. At present we will run—some say 75 feet, some say 100 feet—of main to get a new consumer. Beyond that the cost is prohibitive, moreover, even if the consumer will pay the cost, the leakage on long runs of large pipe often amounts to so much as to make the consumer unprofitable. However, just as in the case of standard high pressure distribution, it is possible to reach consumers in the outskirts of the town and to pipe up small towns which otherwise could not enjoy the benefits of gas, and the type of line used is such as to minimize the leakage, so in this system the same thing would hold. However, in the case of very long runs of small pipe, the drop in pressure at times might be such that it would be necessary to use a regulator to reduce to some steady lower pressure just as is done in the high pressure installation; but, note that you would reach that consumer, whereas now you cannot reach him. It must be remembered that the loss of 10 inches pressure would be no more noticeable even without a regulator than the loss of as many tenths at present when, say, 5 inches is carried, and the carrying capacity of a pipe would be so great, where 10 inches drop in pressure was permissible, that but few installations would require regulators.

It is, of course, assumed that strictly high pressure would be used on the cross country lines, just as at present, and in many cases high pressure lines would be used for belt lines around the town with district regulators feeding at 2 pounds pressure, and, while in the very nature of the case with companies supplying many scattered towns, the size of the transmission lines would be so large that even comparatively large towns could be fed off them even at the time of peak load (and it must be borne in mind that the carrying capacity and storage capacity of lines increase very much faster than the cost as the sizes are increased), still it would be assumed that in the towns having storage holders the gas would be stored up during the light load hours and pumped out again at peak hours. In small towns, where there is no need of an employee at the holder at all times, automatic, electric driven, exhauster outfits, with safety water seals similar to a washbox on a water gas machine, could be depended on, because even if it failed to operate in one town it would only mean that that town's peak load would have to be taken care of directly out of the line.

Every consumer's meter reading would, of course, have to be multiplied by a constant, the same as is done where natural gas is sold under pressure. For example: If the meter read 1,200, the bill would read $1{,}200 \times 1.139 = 1{,}367$ cubic feet, so that the consumer would pay for the gas used at ordinary pressure.

Now let us look at the advantages of 2 pounds pressure right at the tip.

First, take high pressure lighting. In Germany, England and France they have found high pressure street lighting so much more economical than any other form of lighting that whole sections of the largest cities (for example all of the so-called "City of London"

—that is, the 1 mile square area in the heart of London) have been piped with separate mains carrying 2 pounds pressure just to supply these high pressure lights, and the same is true with many streets in Berlin and Paris. For indoor lighting dozens of large factories have their compressor plants for these lights, and their freedom from trouble with the house piping confirms the view that there is no increased risk involved.

For street lighting the "American Review of Reviews," which certainly can't be called a trade journal, says that the saving in lighting the streets of Paris as compared with electricity is 80 per cent. Again, practically all industrial appliances requiring high pressure, can be designed to work as well with 2 pounds pressure as they will with more than this or with both the gas and air under pressure.

Finally the results obtained by Prof. Bone, as described before the American Gas Institute (St. Louis, last October) are all possible with 2 pounds pressure on the gas alone, and the writer believes we will not long refuse to give our patrons the benfit of the increased efficiency possible by such means. Even small lights and appliances designed for this pressure are far more efficient than the present types.

As far as increased hazard is concerned, we know that enormous quantities of gas are now being pumped under such pressures in most of our large cities, through mains originally laid for low pressures, and the writer has known of regular consumers who were getting these pressures at times; and we know, moreover, that the natural gas pressures in many towns often get this high right up to the mixers, and the consumer scarcely notices the difference, because the pressures ordinarily carried are nearly half this amount.

In line with decreased installation costs, the writer sees the dream of the high pressure man realized, when even small villages can have gas, and he goes further than this to say that he believes in the near future gas companies will buy their gas rather than make it themselves. As it is now, except in the case of the large companies, the manager must be a jack-of-all-trades. He cannot devote himself to gas sales because he is busy around the gas works. The writer believes that the gas manager should be absolutely and strictly a commercial man; that he should be fitted and able and anxious to sell gas, and that even his distribution work should be in the hands of a capable foreman.

Take, for instance, the State of Illinois. There is no reason why all the gas should not be furnished say by a half dozen large plants. These plants in turn would sell the gas to transportation companies, which would retain their present individualities. Gas companies do not run coal mines—they buy their gas coal—there is no reason why they should not buy their gas. Anyone who has studied costs knows that the result would be a much more uniform quality and cheaper gas all around.

These large manufacturing plants would work, for example, in conjunction with the coke ovens of the steel plants. It is an economic crime to permit gas of just the right character for our distribution to be used by the steel companies, where they could use cheap coals when the value of the gas so used at best cannot figure out half what it costs the average gas company to make it. As it is now, it is impossible to arrange this matter, because the steel plants must shut down the ovens when the steel mills are slack on business; but a strictly gas manufacturing company, large enough, could take all the gas from the coke ovens and could continue to operate the ovens in such cases, using perhaps auxiliary water gas apparatus, if they wished, to reduce the make of coke oven gas. These gas manufacturing companies would, of course, also be coke and by-product manufacturers, and could contract to take care of any surplus of these products.

To summarize, it would mean considerably less capital costs for plants, even including the cost for pipe lines, and reduced cost for gas at the tip, hence a chance to still maintain the business on a profitable basis, which in these days of rate regulation can certainly be done only by reducing operating costs—and all with a better service and much more extended field of sales.

Discussion.

The President—We would like to have discussion on this startling subject. Will someone speak on it offhand?

Mr. Blanchard—Mr. Battin's paper is of great interest, and it is an able one. I feel that he is working on the right track. And while I am hardly qualified to criticize or enlarge on it, perhaps a few points that appeal to me will, if stated, start discussion. To begin with, I am a firm believer in high pressure gas distribution in the ordinary sense; that is, say a 5-pound line inclosing a section of the city with district regulators, cutting the pressure down to 6 inches; but I confess, until I heard Mr. Battin's paper, the idea never struck me of having 2 pounds at the tip, as he expresses it. I agree with him perfectly when he says, in his opinion, a large per cent. of so-called leakage is caused by shrinkage in the first mile or so of travel from the works. The so-called correction of gas for temperature and barometer, to my thought, does not adequately register the expansion or contraction, and in this matter the manufacturing end of the gas business does not get credit for all of its make, especially in the winter, due to the fact that, at the outlet of the meter, where the thermometer is inserted, the gas is usually colder than the thermometer shows, due to the heat of the pipe caused by the warmth of the meter room, and thus the correction factor is lower than it should be, causing a reduction in the corrected make. However, as the gas temperature in the ground, taken for a whole year, averages about 60° F., I think the loss in winter time, due to lower temperature, is made up for in the summer time. Right here I would speak about Mr. Battin's suggestion of a huge radiator exposed to the air, which he says will regulate the temperature. This will not regulate the temperature to that of the ground, to which it should be regulated to do away with contraction and expansion. The radiator will merely show the temperature of the atmosphere lower in winter than the ground temperature, and higher in summer. I think a sort of condenser would be better, something which the gas will pass through before leaving the works and which can be regulated to the temperature wanted. As to the small screw pipe, Mr. Battin suggests using for 2-pound gas distribution. He doesn't mention the type of pipe he intends using, but I presume he means wrought iron. I think there would be great trouble with electrolysis and corrosion in wrought iron pipe, especially in towns having street cars. I have a few figures here that raise a doubt in my mind as to the safety of 2 pounds on the ordinary meter.

	Total Pressure.
5-light B meter at 2 pounds per square inch.....	1,028
10- " " " " " " " "	1,524
20- " " " " " " " "	2,100
30- " " " " " " " "	2,652
100- " " " " " " " "	6,124

These figures, of course, show the total pressure on the inside of different meters at 2 pounds per square inch, and personally I should not care to sleep in the room with a meter carrying 2 pounds pressure. I talked with several representatives of meter companies lately, who declare their meters are not designed for 2 pounds pressure and that they certainly would not recommend a 2-pound pressure on them. Another thing hard to accomplish would be the convincing of the general public or a City Council of the right of a gas company to multiply its meter readings by a constant, thus raising the total number of cubic feet of gas consumed, In conclusion, I would say that, while high pressure street lighting will work and is working satisfactorily, 2-pound pressure at the tip of a house fixture is too much, and will not work with satisfaction and without danger, with the present meters, fixtures, etc.

The President—Mr. Stillson, will you give us an opinion on this pressure question?

Mr. Stillson—I do not believe I can, as I have not read the paper through with the idea of discussing it; however the only point that I fear in 2 pounds at the tip is in the meter. As Mr. Blanchard just stated, meters, however, can be constructed to accommodate 2 pounds. A meter now in the market will stand a pressure of 2 pounds to the square inch and is used for low pressure. There also are types of meters on the market and successfully operating, which do not depend upon actual measurement of cubic feet of gas by displacement, as these when they are put in common usage will allow the practice of 2 pounds at the tip. The paper is working along the right lines for higher pressure increases the efficiency of the mains per square inch area and decreasing the cost of distributing gas.

Mr. Harper—A few points here that I think are very good, in fact, the whole subject is good. We know that, from an illumination standpoint, we get a great deal more satisfaction by increasing the efficiency of our appliance through the medium of higher pressure. For instance, we secure in the neighborhood of 25 or 30 candles per cubic foot with inverted mantle lamps, burning under pressures of from 2 to 4 inches of water or a little over $\frac{1}{15}$ of a pound per square inch, while over 65 candles per cubic foot have been obtained with similar mantles or lamps operating under 2-pound pressures. We have also found it easier with our heating appliances to be able to obtain

high temperature with the higher pressures at the tip or burner. It may be possible, as Mr. Battin, suggests, to make this of value on ordinary appliances. The point Mr. Blanchard brought out about the radiator I think is very good. To my mind it would not be advisable to place the radiator a mile from the works, in a position exposed to the atmosphere. My belief is that such a device should be under control, preferably at the works. In case of frost, Mr. Blanchard said we find that a very little volume of water will give a large volume of frost, hence it does not take much water or moisture in the gas to block up the pipe. Large radiating pipes would be required if one attempted to carry the temperature of the gas below the freezing point, otherwise there would be stoppage by frost as I think that with a pressure of 2 pounds and a temperature near the freezing point might relieve or eliminate the frost trouble to a great extent in most services or pipes that would subsequently chill the gas. The use of small pipes, so far as house piping is concerned, might not be as ad visable as at first appears. I think all our shopmen will say they have trouble at times with the blocking of small piping. It rusts, and this rust is virtually unavoidable. There is enough moisture in the gas to create that rust and eventually the small pipes, such as ¼-inch, will block up, therefore, there won't be any great gain or saving in pipe from the house piping end of it. I further believe the point brought out by Mr. Blanchard and Mr. Stillson (that of the correction of metered volumes) is good, although it does not seem advisable to attempt the correction of the metered volumes if they could be automatically taken care of by charging so much a thousand for the gas. I think it is working, as Mr. Stillson says, along the right lines, however, and will mean a revolution, you might say, in the gas appliance end of it as well as that of the consumer's meter. Of course, a certain value of education on the part of the consumer as to the proper use of the various appliances installed would be essential.

The President—If there is nothing else to be said generally, I will ask Mr. Battin to close the discussion.

Mr. Battin—The points brought out by Messrs. Blanchard and Harper, with reference to the radiators not regulating the temperature, I do not think exactly right. The radiator being placed a mile from the works, would mean that the temperature of the gas in summer would be reduced to as low a point as it would ever reach in its passage through the main, which in turn is as low a point as it would reach in any situation, because your house piping would naturally be at higher temperature than the ground. On the other hand, in winter the gas would be cooled to a temperature considerably lower than that of the ground, in that it would be cooled to the temperature of the atmosphere, but in most cases you would be distributing a gas that, no matter how cold the pipes were through which it passed, would practically carry no moisture, and the trouble which arises with the rusting of house piping would be overcome. In connection with using the very small tubes, these would be brass or copper, the regular pipes used being, of course, of wrought iron or steel. As to electrolysis, we find as much trouble in one town with cast iron pipes from electrolysis as we have in a dozen other artificial towns where we are using wrought iron pipes. The reason is that a wrought iron pipe is practically a perfect conductor from one end to the other. As to the pressure on the meters, I did not make that statement without making some tests. I used high pressure gas, and, as matter of fact, I ran up as high as 6, 8 and 10 pounds and not one meter let go. In high pressure distribution every once in a while a diaphragm lets go, and the little air vent being plugged by somebody they get a pretty stiff pressure on the meter. Of course, meters are made that will stand almost any pressure you want to put on them, and there is much difference between the distributing system of natural and artificial gas companies, the former not being half as careful about their pressures as we are, but they are adopting tin meters even into their high pressures. I do not advocate charging a rate to compensate for the difference in value brought about simply because you would have to raise your rate, which is something a gas company finds it pretty hard to do. In other words, you would have to charge $1.14 for that gas, and that I do not think you could do, no matter how strong an argument you advanced.

(To be Continued.

Mr. N. O. Goulding, Superintendent of the Natick (Mass.) Gas Light Company since 1897, has joined the selling force of that well-known house (Tenny, Morse & Co.), whose headquarters are in the premises, 143 Pearl street, Boston. This concern is known to all gas companies in the East as dependable dealers in wrought iron pipe and gas, steam and water works supplies.

[Continued from Vol. XCVI., Page 444.]

FOURTH ANNUAL MEETING, SOUTHERN GAS ASSOCIATION.

Held in the Seminole Hotel, Jacksonville, Fla., April 17, 18 and 19, 1912.

First Day—Afternoon Session.

The President introduced Mr. A. B. Kelley (Phila.) who read the following paper on

SCIENTIFIC SALESMANSHIP AS APPLIED TO THE GAS INDUSTRY.

Much has been written and much, oh! very much, has been said on the subject of "Scientific salesmanship;" so much, in fact, that it would demonstrate on my part a lack of appreciation of your intelligence, or at least it would be carrying coals to Newcastle for me, to attempt to define or explain what scientific salesmanship is, or even to attempt to point out how it may be applied to the gas industry.

However, I suppose there is really something in "*noblesse oblige*," so I shall strive manfully to live up to my title. Scientific salesmanship, being the basis upon which this discussion rests, is entitled to our first consideration. Such being the case I advance the proposition that scientific salesmanship is, when all is said and done, and the veil of technical language is withdrawn, nothing more or less than the persistent application of good, hard-headed, common sense methods to selling; and that applies just as much to the gas industry as to anything else; possibly a little more.

I do not wish to be understood as denying the value of a knowledge of psychology, of a careful study of human nature in general, and our prospects in particular, or of a carefully studied plan of attack. All these things are immensely valuable; but, admitting their force and virtue, where are they without the presence of ample good, common sense?

In the course of the day's march it is no unusual thing to find that the man in any given situation, who brings in day-by-day and week-by-week the most, the best and most lasting business is the man least confused by theories, most richly endowed with common sense, and possessed of a will to work.

No conscious application of any given rule of psychology tells him that, when he calls on a business man or a housewife, to find that person actually engrossed in his or her own work, he will create his best impression by making his presence known and then promptly leaving; he does it instinctively, then calls very soon again, while the feeling that he has been considerate is still fresh and flourishing in the minds of his prospects.

No amount of study ever hurt a man, and there is no truer adage than "Knowledge is power," but it is not conceivable that hard-fast-scientific rules can be laid down, that will enable every man who wants to sell, to overcome the objections or prejudices of every person to whom he tried to sell, nor can there be rules made that will pluck out all the thorns and leave only blossoms on the order bush.

There is, however, much more to scientific salesmanship as applied to the gas industry than the mere conquest of the prospect and the production of the orders at the end of the day's work; there is the question of office system—this should be accurate and exact but *not* cumbersome. There is the question of co-operation between the commercial and distribution departments, to the end that the salesman may know what promises he can make with certainty that his pledges will be fulfilled; there is the question of carrying an adequate and sufficient varied stock of appliances and supplies, so that orders may be accepted and promptly filled; there should be a liberal foresight in the buying of what the salesman must offer, so that with seasonal, or even temporary climatic, changes he may take advantage of altered conditions and sell the article to suit the occasion.

One of the basic elements of salesmanship is confidence; not merely the salesman's confidence in his own ability and willingness to perform, but his confidence in the fairness of his company's attitude toward the public it serves and employs him to serve, confidence in its intention and ability to back him up thoroughly in any promise it has authorized him to make, and confidence in the ability and efficiency of his fellow employees whose duty it may be to do the work called for in the order he takes.

There is still another kind of confidence, which is of vital importance to successful salesmanship, and that is confidence in the intelli-

(*Continued on page* 10.)

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NEW YORK, MONDAY, JULY 1, 1912.

BRIEFLY TOLD.

MEETING OF THE BRITISH INSTITUTION OF GAS ENGINEERS.—Even "Rainy Jupiter" withheld his wondrous tearfulness while the current yearly meeting of the Institution of Gas Engineers was declared in session the morning of the 12th of June. The delegates and visitors (and these numbered well into the hundreds) presented an imposing body, as one viewed the hall (Royal Service Institution, in Whitehall, London) from the reporters' "coigns of vantage." And the "mass" was dry, for the morning of the 12th was the first morning of the month of roses in which the rain was not in evidence. The direction of the meeting was in the capable speech and hands of Mr. R. G. Shadbolt, of Grantham works. By nature of commanding presence, through heritage and personality a gentleman, by virtue of training an engineer of high degree—such was the thought which flashed through your correspondent's mind when the sage of Grantham announced the opening of the meeting. And surely a second glance over the well-appointed convention hall, certainly excused your correspondent's second thought, "And these are gas men!" It is well. The report of the Council was really an extraordinary document, containing, as it did, complete references to many matters of moment to the industry. Naturally the coal famine, brought on by striking miners, the interruption to local transportation caused by the railway guard's union cessation from labor, and other difficulties caused by these and sundry minor whimsical acts of the "man who works" were duly noted. Truly, the industry, in common with the country at large, had a hard time of it in 1911-12. The London medal (the gift of Mr. H. E. Jones) was awarded to Mr. C. Dru Drury, in recognition of his paper last year on vertical retorts of the Dessau type, and the same gentleman captured the gold medal of the Institute for like reasons. The silver token of merit went to Mr. E. W. Smith, for his 1911 communication on the use of high pressure gas for industrial purposes, and the bronze trophy was presented to Mr. J. G. Newbigging for his lecture on the Glover-West installation of verticals at Manchester. The technical routine out-of-the-way (and there truly was a plenty of it), President Shadbolt read his inaugural message. Of a verity this was an extraordinary document. It contains matters of exceeding variety—the range being between structural work and the reduction of Sunday labor to a minimum, which is a veritable hobby with Mr. Shadbolt—and nothing treated upon seems in any way slurred. Wherefore one may without undue process of thought reach the conclusion that for many days and nights the President spared not the hours. What was certainly a lecture on "The Futility of Minimum Illuminations Comparisons," which really had to do with certain proposals from the authorities in respect of street lighting and street photometry by that brilliant expounder, Mr. Jacques Abady, and the report of the Refractory Materials Committee (unfortunately, owing to severe illness, Chairman J. W. Helps was not present), but he was ably represented in the person of Mr. F. J. Bywater, really concluded the business of the first day. Wednesday morning the education of gas fitters, and things germane thereto, were considered, the disposition of which brought the paper list as the current thing. The first considered was that by Mr. H. Townsend, on the "Day Load Factor in Gas Safety." Mr. Townsend is evidently a practical man, for, with all due respect to differences which undoubtedly harass the electrician in the instance of "loads," the Townsend ways and means of bettering the high, middle and low load are to be not chary with holder capacity. So that, through selling as much gas per head of population as possible, by cheapening the selling rate to the lowest reachable notch, the all-round load may be recorded with satisfaction.

Then there was a most attractive paper by Mr. W. A. Onslow, whose collection of actual workaday notes in the premises of high pressure gas lighting was worth hearing. The paper was an eminently practical one, and perhaps Mr. Onslow will pardon us if it is here remarked that its tone is quite like that which one would expect from our expert in America on this subject, Mr. Paul F. Reichhelm. The "Evolution of the Stockport Gas Works" was then chronicled by Mr. S. Meunier; and surely the author was at home with his topic, for within one-quarter century, under his careful guidance, the output at Stockport has gone from 400 millions to 900 millions cubic feet per annum. The Thursday sessions were commenced by the presentation of a paper (it was really more in the nature of a lecture) by Dr. R. Lessing, on "A Laboratory Method for the Comparison of the Coking Properties of Coals." Its subject matter was really not new to gas men, since this presentation was virtually a repetition of that given by Dr. Lessing before the London Section, Society of Chemical Industry, earlier in the month. The technical part of the proceedings was virtually at an end when the papers, respectively, by Mr Thomas Glover, on "Examinations in Gas Engineering" and on "The Examinations in Gas Supply." by Mr. J. H. Brearley were considered. A ludicrous item in connection with the discussion on these was that contributed by Mr. A. F. Browne, who declared that the Examiner was haunted, even to his tubbing time, by candidates inquiring for papers, ratings and the like. The officers declared elected were:

President.—Mr. Corbet Woodall.

Vice-Presidents.—Messrs. John Bond (Southport) and Edward Allen (Liverpool).

Council.—Messrs. S. Glover (St. Helens), C. Dru Drury (Sunderland), T. Berridge (Leamington), J. H. Brearley (Longwood).

Hon. Secretary.—Mr. S. Y. Shoubridge (Lower Sydenham.)

Our readers will be interested in knowing that the incoming President of the Institute is the father of the present Managing Engineer of the Brooklyn Borough (N. Y.) Gas Company, Mr. George H. Woodall. London was chosen as the next meeting place. Prof. W. A. Bone was elected to Honorary Membership. It might be remarked that a great outburst of cheering followed the announcement of Mr. Woodall's election. And amongst the votes of thanks passed to the gentlemen who had so ably arranged for and conducted the meeting, the heartiest of all was that accorded to that Prince of Secretaries, Mr. Walter T. Dunn. Amongst the visitors in attendance from this side of the Atlantic, was Mr. Arthur Hewitt, General Manager of the Consumers' Gas Company, of Toronto, Ont., and President of the Canadian Gas Association. He was especially invited to share in the proceedings, and availed himself of the invitation. As to the social side of the convention, the preparations for these were on a very hearty scale, perhaps the most enjoyable of which was the reception by President Shadbolt and Mrs. Shadbolt, who entertained their guests the evening of Thursday (13th June) at the Connaught Rooms, Queen street, W. C. This function was attended by 600 visitors, who pleasantly shared in a concert or in dancing, or both as fancy dictated. Refreshments were served in the grand hall; and, altogether the function was heartily enjoyed. This, of course, is not to be wondered at in that Mr. and Mrs. Shadbolt are of the sort who can entertain in that fashion which precludes the thought of class.

RESPECTING THE ATLANTA CONVENTION: NATIONAL COMMERCIAL GAS ASSOCIATION.—Secretary Stotz and his Committeemen evidently have been up and doing respecting the Atlanta Convention of the National

Commercial Gas Association, as witness these particulars regarding space assignments for the exhibitors who propose taking active part in the appliance display. Here is the list, up to the 25th June:

Exhibitors.	Location.	Booths Taken.
Beler Water Heater Co.	Pittsburgh, Pa.	103
Central Flatiron Mfg. Co	Binghamton, N. Y.	23
Clark Co., George M.	Chicago, Ills	52, 53, 54, 55
Crane & Co., Wm. M.	New York, N. Y.	117
Crandell Pettee Co.	New York, N. Y.	89, 90
Dangler Stove Co.	Cleveland, O.	38, 39
Detroit Stove Works	Detroit, Mich.	29, 30, 31
Eclipse Gas Stove Co.	Rockford, Ills.	10, 11, 12, 13, 25, 26, 27, 28, 41
Estate Stove Co.	Hamilton, O	14, 15
Equitable Meter Co.	Pittsburgh, Pa.	44
Fiat Lux Co. of America.	Chicago, Ills	92
Fuller & Warren Co.	Milwaukee, Wis.	61, 62, 63
General Gas Light Co.	Kalamazoo, Mich.	40, 56
General Gas Appliance Co.	New York, N. Y.	97, 98, 107, 108
Humphrey Company.	Kalamazoo, Mich.	72, 88
Lloyd Construction Co.	Detroit, Mich.	24
Michigan Stove Co.	Detroit, Mich.	57, 58, 59, 60
National Gas Light Co.	Kalamazoo, Mich	68, 69
National Stove Co.	Lorain, O.	70, 71
New Process Stove Co.	Cleveland, O.	45, 46
Pittsburgh Water Heater Co.	Chicago, Ills.	112
Public Service Co.	Pittsburgh, Pa.	86, 87
Rathbone, Sard Co	Albany, N. Y.	36, 37
Ringen Stove Co.	St. Louis, Mo.	77, 78
Reznor Heater Co.	Mercer, Pa.	8, 9
Roberts & Mander Stove Co.	Philadelphia, Pa.	32, 33
Rosenbaum Mfg. Co	New York, N. Y.	76
Ruud Mfg. Co.	Pittsburgh, Pa	93, 94, 104
Schneider & Trenkamp.	Cleveland, O.	64, 65, 66, 67
Strause Gas Iron Co	Philadelphia, Pa.	83
Union Stove Works.	New York, N. Y.	49, 50, 51
Vesta Gas Range Co	Chattanooga, Tenn.	47, 48
Weir Stove Co.	Taunton, Mass.	4, 5
Welsbach Company	Philadelphia, Pa.	113, 114, 115, 116
Wood Mfg. Co., John.	Conshohocken, Pa.	102

PUBLICITY WORK.—Publicity work may be divided into four classes: Assisting in obtaining new business, retaining old business, increasing the prestige of the company, improving the relations between the company and its employees. According to current practice new business departments can be aided very materially by efforts to increasing the interest in the several hundred types of gas consuming appliances, by means of carefully prepared advertising matter, placed on the backs of bills, or on stickers, cards, pamphlets; also, through regular monthly bulletins, together with newspaper and other advertising mediums. Present consumers will appreciate better service through having their attention directed towards the methods of properly utilizing their appliances, and when they are encouraged to apply to the company for assistance. Of course, these consumers can be certainly reached by means of descriptive articles in monthly bulletins covering the operation of lamps, ranges, heaters, water heaters, industrial appliances, etc. As the prestige of a company depends largely upon the service it renders, the knowledge of the scope to which its product can be applied in the home, the office, the store, the factory and in other places indoors and out, it should be borne in mind that this is probably the most important, and most difficult, problem in publicity work. The means at hand include all of the foregoing; and, in addition, newspaper articles regarding manufacture, distribution and managerial work. Lectures in the public schools, Y. M. C. associations, churches, local improvement clubs, and numerous other organizations, aided by booklets of a more or less technical nature, such as house-piping for architects, builders, plumbers, etc. But the vital feature of publicity lies in the attitude of the employees toward their employer and toward the public. That a company is largely judged by the employees it keeps in service, cannot be gainsaid. The truly valuable asset of able and enthusiastic workers can be obtained by careful selection and by earnest efforts to insure proper mental equipment. This means vocational schooling which is of practical value, even though its aim is the education of men in their own business. Gas company employees should also be taught the elements of manufacture, distribution, and sale of the product, for thus equipped they will be enabled to handle all problems with higher efficiency and with greater zeal. And all this will well repay a round expenditure, even if it should eventuate (as it probably will) in raising the rate of wage paid to such laborers.

CURRENT MENTION—

MR. HENRY I. LEA, the well-known consulting gas engineer, whose headquarters are in Chicago, has been retained in connection with the proposed reconstruction of the gas manufacturing plant and the distribution system at Excelsior Springs, Mo. Plans and specifications are now being prepared, and machinery and apparatus men might do well to remember that Mr. Lea will soon be in the market for bids.

MR. JAMES W. LANE, writing from Salisbury, N. C., under date of the 25th inst., says that the work of laying the high pressure distribution system for the plant at Salisbury, that is being financed under the direction of the Messrs. W. N. Coler & Co., of this city, will be finished the 10th inst. Mr. Lane has promised to describe for our readers the difficulties encountered in the prosecution of this work.

THE officers of the "Straight Filament Lamp Company," with headquarters in 42d street, N. Y., and Rose street, Philadelphia, are: President, John Gribbel; Vice-President, Louis J. Kolb; Secretary and Treasurer, William H. Roberts. The Company's specialty is "The Rayline Lamp."

THIS action was taken at a special meeting of the Board of Directors of the Central Hudson (N. Y.) Gas and Electric Company, held in its offices, Newburgh, N. Y., the 15th ult.:

On the 4th day of June, 1912, William Reynolds Beal, the President of this Company from its organization, as he had been the President of both the Newburgh and Poughkeepsie constituent Companies from their incorporation, passed peacefully out of this life at his home in Newburgh. For the third time, within a year, this Board is again called upon to suspend its business and give solemn thought to the certain end of all our labors, and to question ourselves as to how, while we are still permitted, we are discharging them. For him there can be only a happy and thankful answer, now that the completed record is all before us. The battle of life commenced for him at a very early age, and consistently and continuously, with both strength and courage, he met its difficulties and fought his way ever onward and upward to the end of his days. Not only did he meet with success in his business, but from his earliest youth he used his life in service; a consistent Christian, he worked through his church to extend the kingdom of God on earth, and in social and educational fields he labored that men should be more truly brothers. When he organized the companies which are now represented by this Company, he brought to them not only the successful experience of nearly ½ a century in similar enterprises, but he gave to them the prestige of his name and his character, and so made easy of solution the financial and practical problems of the reconstruction period. We recall with gratefulness all that he was and all that he did in this relation during this unbroken period of service, and we lament that "the silver cord" which bound us to him in such helpful and friendly association should be loosed and the "golden bowl broken." Into the wonderful happy family circle that continued so long uninterrupted, we must not enter, except to say with reverence our deep sympathy with those who bear the heavy burden of grief that has fallen upon them.

Resolved, Therefore, that this Board inscribe this minute in its records in testimony of the faithful, high minded, good man, who so long served this Company, and in recognition of the esteem and affection in which we held him.

Further Resolved, That an engrossed copy of this minute be prepared and sent to the members of the family.

Publications.

[All Publications, Catalogues, etc., mentioned below, are kept in our office for the convenience of our patrons.]

New York Public Service Commission, First District, 1910 Report.—Volumes II. and III. of the Public Service Commission, First New York District, are now ready for distribution. Volume II. contains complete records of orders and formal cases, and Volume III. carries the statistics of the transportation companies.

The Booster.—The several public utility properties comprising gas, electric and street railway systems of New Albany and Jeffersonville, Ind., and environs, publish a small monthly bulletin known as "The Booster," for circulation amongst both its employees and the public. In addition to timely articles concerning the business, a novel feature is a list of buildings for rent and property for sale. Among the real estate operators who will be found is the name of Mr. James W. Dunbar. "The Booster" is published through the initiative of Mr. Martin J. Insull, General Manager of the several properties.

(*Continued from page 7.*)

gence of our public. We who sell know our subject, or at least we certainly *should* before we can hope to talk it intelligently or impressively to our prospects; and we know it because it is *our business to know it*, and our success depends upon the extent of our knowledge. But there is no conceivable reason why the average prospect should know any more about gas than the fact that it produces light, heat and power; and it is not fair, nor is it wise, to feel that a prospect lacks intelligence because he doesn't know the difference between an upright or inverted lamp, or what makes a blue flame and what a yellow one.

The prospect's intelligence has been developed along different lines, and it may be very broadly developed so that it will instantly absorb the virtues or the faults of any argument presented to it, provided the argument is *intelligently* presented; and the average person is quick to perceive the most remote implication of lack of intelligence and to bitterly resent the slight. In this connection, and to make my point clear, I must digress for one moment to relate a personal experience in demonstrating what I mean by lack of confidence in the intelligence of the public. For some years it was my happy lot to write the newspaper advertising for the United Gas Improvement Company, not only for Philadelphia, but for all of the cities in which that Company is interested. In the early days of the advertising department it was customary, to a far greater extent than prevails to-day, to submit copy to the various commercial agents, particularly as to questions of local policy where the advertising dealt with subjects involving questions of pressure, etc.

One of the best informed commercial agents in the system once seriously objected to the use of the word "effiiciency" in one of the advertisements submitted to him, on the ground that the public would not know what the word meant.

Now, it may be taken for granted that the public as a whole is ignorant of what our *measure* of efficiency is, but it may also be taken for granted that our public knows perfectly well what the word means, and that when we speak of greater efficiency we mean a greater capacity for performance, and that when we apply it to an article we are selling we mean that the article is a better and more satisfactory article. It took some time to convince the gentleman in question that there were two or three people outside the gas industry who actually knew what the word "effiiciency" meant, and that it did convey the thought of good performance regardless of the number of candle power or B.T.U.'s involved.

This should not be taken as a plea for the use of technical terms, either in selling talk or advertisement. Plain language, everyday words and phrases should be used wherever possible, because it is the wellnigh universal habit of mind to think in the simplest terms. But it does mean that the proper word, be it technical or otherwise, should be used to fit the proper case, with full confidence that it will be understood.

One vital factor in salesmanship in the gas industry is knowledge that the company has in stock the article the salesman is selling, so that he may know what to promise as to delivery and installation. In this connection let it be said that every salesman should know just what appliances are actually on hand, and an ample stock should be carried, so that he may take advantage of any sudden change that may occur and sell gas ranges during a hot summer morning and lights in the sudden darkness of an afternoon thunderstorm, water heaters at the proper time, and heating stoves, if it comes on cold toward nightfall, and any of the smaller appliances whenever opportunity affords. From all of which it may be seen that scientific buying is the rock upon which scientific salesmanship is founded.

It would be possible to extend this discussion indefinitely by the citation of countless instances where sales had been made by the application of some one, or some combination, of the hard-and-fast rules of scientific salesmanship; but each one would be some special instance and might or might not admit of sufficiently general application to be of value to us; and, when all is said and done, it seems to me the very essence of scientific salesmanship as applied to the gas industry, or any other industry, is work; hard, steady, conscientious work, and the constant application of common sense to that work.

I know of no more striking example of the work part of this theory than the success Mr. Bowlin has achieved in selling gas for lighting right here in Jacksonville; and I know of no more convincing exhibition of the common sense part of it than his reply to a question put to him at your convention in Montgomery last year, when he was asked how he overcame the question of heat from gas in lightin billiard parlors in a locality as hot as Florida. His reply was; "I tell them Florida's hot!"

Let us, therefore, not be appalled by the high sounding title, "Scientific Salesmanship as Applied to the Gas Industry." Let us give careful heed and let us ponder thoughtfully every technical treatise we can find on the subject, and let us absorb all the information we can obtain, but let us never forget that when the last thought has been expressed and the last word has been written or spoken, scientific salesmanship as applied to the gas industry is composed of:

Work, common sense, confidence in ourselves, in our employers, in our commodity, in our appliances, in our fellow workers, in our public, in our public's intelligence, common sense, work.

Discussion.

The President—The paper is before you. Will Mr. Pierce start the discussion?

Mr. Pierce—A suggestion I would make regarding Mr. Kelley's admirable paper is that I don't believe it is enough to have confidence in the intelligence of our public. It seems also necessary to increase that intelligence by giving them more information about the product they are using. People are more prone to use appliances and products of which they know something, having confidence in their ability to use such intelligently, so the more intelligent use they make of our product the more satisfactory it will be to them, and the more business we will obtain. For instance, the four types of incandescent lamps manufactured by the General Electric Company, the tungsten, tantalum, metalized and carbon filament lamps, each has had a certain field; that is, at certain costs for current. For instance, the tungsten lamp would be the most economical to use at and above a certain current cost, while below that cost and down to another cost, the tantalum would be most economical. By giving customers a full idea of the efficiency of different types of apparatus the General Electric Company was able to discontinue absolutely the carbon filament lamp, simply by showing other types of lamps which were more efficient. This was accepted by the trade, and to-day those superseded lamps are off the market entirely. If those customers lacked information and knowledge of what efficiency meant, the General Electric Company would have had a very difficult time in getting the undesirable lamps off the market, and was in fact able to take them off altogether because its customers had been educated at considerable expense in the efficiency of the different types of lamps. We have like work to do in educating consumers of gas so, when they find a certain appliance more efficient than another one, or which should be selected in preference thereto on account of its efficiency, we will have no trouble whatever in selling it, because our customers can see at once the logical reason for changing to that appliance, or to adopting that appliance in the first place, which would be difficult to do if the customer does not have a pretty good idea of what efficiency means.

Mr. DeFrese—I would like to hear from Mr. Rushin.

Mr. Rushin—Not meaning to discuss Mr. Kelley's paper, I will, however, repeat a germane instance as it happened. Last fall on asking Mr. Kelley to read a paper on "Scientific Salesmanship as Applied to the Gas Business," we looked at each other. Of course, modesty forbade Mr. Kelley from saying he didn't think any science was applicable to the selling of gas appliances; of course, I couldn't tell Mr. Kelley I didn't think so either, for was I not trying to get him to write a paper? However, I wished to have this subject discussed by a salesman and an advertising man, because we don't train people along the right lines for selling gas. We haven't been instructing them long enough. They have been trained along the lines of making gas, but have not been trained in the disposing of it. Last year Mr. Kelley gave us a good paper, and I was trying to study up some scheme by which I could get him back this year, at the same time having my little pet hobby attended to by such an adept as Mr. Kelley. Now, notice in the first sentence he says he will strive manfully to live up to the title of his paper. [Laughter.] I think he did, and we need a good discussion on it. We will need other papers in the future on "Scientific Salesmanship as Applied to the Gas Business," or papers with like titles on a like base. We want to hear from you all, and as long as our President will let you vent your feeling. Mr. Kelley used every effort on earth to get out of this. Finally, mustering up courage, he wrote me: "Jim. Rushin—Honestly I can't find a thing in the world to say on 'Scientific Salesmanship as Applied to the Gas Business.'" I couldn't either; so I said: "Go ahead and shoot at it. If you hit it, all right; if you miss it, all right."

Mr. Hoyt—Gentlemen, this excellent paper should interest every man here, for, no matter what his title on the payroll may be, he is interested in the sale of gas. This is particularly interesting to all connected with the sales' force, but it should certainly be discussed by those directly connected with gas selling.

Mr. Hunter—As a small fellow, I am going to say more than my share. I always found, in working as a salesman to sell gas or sell an appliance, that it is easy for a gas man to answer questions, but when he meets Mrs. Jones, who says, "My cook doesn't know anything about it, and it's too expensive for her," he has no argument. Following the lines of the Manager of the largest Company in this State, I founded a cooking school for colored cooks. I had two salesmen then, and my young men would say, "Send your cook over there on Tuesdays and on Friday afternoons." We have a colored industrial school in our town, and a cooking school is also there. The instructor in domestic science goes to a hall set apart for colored people twice a week, to instruct all present in the use of gas stoves. It worked very well. It is impossible to employ a demonstrator continuously, by reason of the fact that our place is too small. We have a very well equipped club room for women there, and we outfitted them thoroughly with apparatus for water heating, general heating and cooking. In order to take the taste of advertising away from it, I suggested to the President of the Women's Club that the Gas Company would be willing to assist in defraying the expenses of any lecturer she might get. She got an instructor in domestic science from Tallahassee, who gave a series of lectures on cooking; incidentally, the cooking was done on a gas stove. This helped to sell a few stoves, and it also caused the ladies to ask and discuss questions. They came to the office and questioned the solicitor about these things, and these two things helped me sell more gas stoves than any other trial or way. It is nigh impossible for a little one-man gas plant, such as we have in the South, to adopt the rules or methods of the larger companies. We are too busy hustling for the coal man and the oil man. It's out of the question to teach solicitors constantly, but by placing the heating appliances in a women's club, at the gas company's expense—they meet once a week and see the apparatus, ask questions and incidentally buy heaters. In so doing a small company is able to develop its branch of salesmanship in more economical way than by any other method I know.

Mr. Bowlin—Near the beginning of this paper Mr. Kelley remarks, "One of the basic elements of salesmanship is confidence." If we send out a man to sell an appliance, who hasn't confidence therein or doesn't understand them, he will not make a good impression for the company, and the chances are he will not make a sale. One with confidence in the appliance he is selling and confidence in his company, will soon become a scientific salesman, because he will feel it to his interest to go into the subject to learn everything he possibly can, so he can impart such knowledge to his prospects. He further says, "There is still another kind of confidence which is of vital importance to successful salesmanship, and that is confidence in the intelligence of our public." A good many salesmen go out with the idea that our prospect knows something or knows nearly as much about the appliance as we do ourselves. Of course, we very seldom give him credit for knowing as much about the article as we do, but I think we all should explain every minor detail of the appliance so that he will fully appreciate it to the fullest extent. On page 4 is the statement: "One vital factor in salesmanship in the gas industry is knowledge that the company has in stock the article the salesman is selling, so that he may know what to promise as to delivery and installation." Oftentimes, in approaching a prospect, one is apt to promise the installation of the appliance sooner than the shop can install it. Every salesman should make it a point to know about when the appliance could be installed. If it is a special appliance, he should know how long it will take to get it in stock if the company hasn't got it, and he should not promise the installation of an appliance unless he knows that it absolutely can be installed at the set time. This paper, as a whole, is one of the best ever read. It hits right on the head. The real definition, as Mr. Kelley says, of scientific salesmanship is the persistent application of good, hard-headed, common sense methods of selling. A man who has good common sense, is nearly always apt to be a salesman.

Mr. White—Reference was made to one who was my boss for many years. A gentleman in Denver many years ago took the stockholders by storm when he said, "We are going to sell gas and electricity the same as any merchant sells anything else." He then organized what I believe was the first new business department known anywhere, and all you have to do is to look at the experience and study the work and securities and the earning value of the Denver Gas and Electric Company compared with the record there 8 or 9 years ago. The securities of that Company 3½ years ago sold at 87; to-day they are selling above 200. Their earnings are many times the gross and net than they were 6 or 7 years age. I think I quote Mr. George Williams correctly in the report he made to a very large gas company some 6 or 7 years ago, when he said, "There are more pianos in use in the city than gas stoves." His statement was doubted by some persons interested in the development of that Company, but upon taking their own statement as to the number of gas stoves out, likewise the number of pianos, Mr. William's statement was shown to have been not greatly wide of the mark. As to carrying adequate and sufficiently varied stock of appliances and supplies. Those who have traveled more than I have around the country, visiting the various gas companies, probably meet a condition like this. In a small store, with a rental value of probably $50 a month—I have one particular company in mind, in a very large city, except that it is an electric and not a gas company, but the application is just the same. In this particular company, located on a fairly prominent street, the only electric appliance in the window was a vacuum carpet cleaner, and the dust was so thick on the window that you could hardly see that. If there was one dead fly in the window, there were at least 500 strewed over its floor. It was a very large proposition. The storeroom or salesroom actually didn't seem as though it had been cleaned for a week. In fact, it was a joke. Gas companies probably having an investment of $100,000 in works, mains and holder, may have in their offices 2, or 3, or 4 ranges spread out somewhere, possibly a few Welsbach burners, yet they try to sell gas and electricity. They also say, "We don't want to put much money in stocks or in the goods." As to our own place. Those of you who have visited us, realize that we try to carry a large and varied stock, and you would be surprised to know how many times we turn that stock over in a year. When we buy a carload of ranges we don't expect to keep them, but try to get as many of them as possible on the floor. When those are gone, we get others to take their place, in an endeavor to have all the time from 20 to 30 gas ranges on our floor. It certainly has paid. Reference made in another paper to the relative number of cabinet ranges to those of low type. Our Montgomery experience has been a 10 to 1 proposition, and I believe our results are due to pushing that particular type of range. On our cabinet type of range the prices ranging from $28 to $100, and it's surprising how many times we sell examples of the latter. A boarding house keeper the other day said: "I want that range, right over there." Being a very large one, we didn't think she could afford to pay for it. However, we took chance. Probably she will pay for it, if not, we will take it back. Nobody is hurt, even if it be damaged a little. Then we will sell it to someone else for a little less money. Another thing in the paper that appeals to me, has to do with the confidence that we should inspire in our new business men. In Chicago 6 years ago I said we shouldn't send our new business men out as though they were like wet rags. We should give them all the boosting we can, even if we have occasionally to back them up because of a mistake. If a fellow makes 10 good turns then makes one mistake, I would be gentle with him therefor. We want to let him feel that the company is back of him, and if he is in error as to a quotation, or as to the length of a main to be run for a consumer, or is in error as to the name of a consumer, we back him up as far as we can consistent with good business methods. I believe we are doing ourselves good as well as the man. This is a paper we can take home and read with considerable benefit to ourselves as well as to those with whom we associate. [Applause.]

Mr. A. F. Kersting—The remarks of Mr. Kelley's study on "Scientific Salesmanship as applied to the Gas Industry," while limited in words, have covered the general truths of the subject in a most complete and concise manner. I feel I could add very little to the value of this paper by offering any suggestions; but the biggest point I could make in this connection is to urge you one and all to read it and re-read it and absorb the valuable suggestion made therein. I have gone over the paper four or five times and each time found something more to profit by. The concentrated results with which he concludes, as covering the essentials to successful salesmanship, that is, "Work, common sense, and confidence are the keynote to the desired end." Most careful attention should be given to the different divisions to which we should have confidence. Each one of the seven component parts is most vital to the general success of the quest. A suggestion I would offer in connection with the subject of successful sales, is to study the examples that we each have as exemplified by

the few leading merchants in our locality. In each city will generally be found one merchant in each of the few general commodities. who stands pre-eminent over all other competitors. He has risen to this enviable position solely through the force of scientific or successful salesmanship. When we deal with this man we readily recognize, by the general air of every factor that constitutes his establishment, why he leads his competitors. We take more pleasure in dealing with this merchant than we do with the others, for we are sure that our dealings will be satisfactory with him, and there is a certain added feeling of satisfaction in knowing that we have dealt with the best merchant in the line. I think this illustration has its exact parallel in the gas business. The spirit of success that forms the secret of the best mercantile house, if inculcated in our own business, will make our own success equally great. This applies as much to the sale of our service in the use of gas for all its various purposes, as it does the sale of appliances and better appliances.

On motion a vote of thanks was, by rising vote, extended to Mr. Kelley, in appreciation of his paper. A similar motion was also carried in respect of the paper by Mr. Case.

The President then asked Mr. Kelley to read the paper by Mr. H. P. Daines (Phila.) on

GAS LIGHTING IN THE SOUTH,

owing to the unavoidable absence of the author.

This paper is written with a view of offering for your kind consideration the development of gas lighting in the south. Are there possibilities of increased gas lighting in the southern states? To this the writer must answer in the affirmative.

Can good gas lighting be found in the south? To this the writer will again answer in the affirmative. In the writer's experience the only towns showing a decrease or lack of growth in gas lighting are those found to be handled by combination companies, where one will invariably find a most eloquent electric general manager, who has never been educated to an understanding or appreciation of the efficiency, candle power and economy of modern gas lighting. We believe such a man to be sincere, but cannot agree with his ideas of modern light.

The average general manager's method of handling the gas end of the combination property is to instruct his Superintendent of the gas department as follows: "Go out and hustle for fuel business of all kinds, but do not interfere with light; we want this left alone." And the same general manager, if interviewed in regard to gas for illumination, will state that gas is a back number or a "has been" factor for illumination. He forgets that he has refused to allow any development of gas lighting.

This brings to mind a superintendent of a gas plant placed in such a position a few years ago in a town in which gas was almost unknown, and he answered his superior in the following manner: He cleaned up the works, gave prompt attention to complaints and proper attention to the distribution and manufacture of gas. All this bore fruit.

These few simple little acts have turned the gas end of this combination company to a profit and dividend basis, instead of a continual loss to the stockholders, and have increased the output of gas over 150 per cent. without any extension of mains. Mind you, gentlemen, this was all produced on old lines upon which heavy investment had been made, and then nothing done to develop the business; but do you realize that only an earnest, conscientious, firm belief in the good qualities of the product manufactured made this possible? Mr. Gas Man, do you believe in the product of your plant?

If you do, why not say to the public on your mains, "Gas is the Twentieth Century light; use it to see by, and use it for general illumination," quite as often and as forcefully as you say "Cook with gas, the Twentieth Century fuel." Truly, the modern illuminating fixtures and lighting appliances have made gas the Twentieth Century light. Truly, the harvest to reap is plentiful. Are you going to be a reaper of this abundant harvest, or are you going to leave this attractive return of 365 days each year to the other forms of lighting?

A very serious competitor in many Southern towns is Mr. Gasoline. Can he operate in a live gas town? The writer must say no! But he does thrive and grow strong in any town where gas is not found to be a competitor. Many combination companies have found gas to be the only weapon with which they can successfully meet this arch enemy which is surely an eyesore to modern illumination. This is due to the high efficiency and candle power of gasoline lighting and its economy over other lighting mediums. One of the best lighting propositions south of Washington, D. C., can be seen in the railway station at Fredericksburg, Va. It consists entirely of outdoor, inverted, gas arc lamps, hung under the shed and on single arm posts, 16 feet high, and covers in length about 700 feet of platform which crosses streets at each end of the station.

It is modern, because the light is the best and most reliable artificial light known (in a place where reliable light is important), and all the lamps are located by a pushbutton system located in the baggage room of the railroad station. This installation is due to a hustling, live superintendent of the City Gas Works. Then I would refer you to Tampa, Fla., where a gas "White Way" is now in progress. This town had scarcely any gas lighting 1 year ago, but it can now point with pride to almost 1,500 gas arc lamps, which welcome you into the town and bid you good bye on leaving. This was accomplished by pushing aside very keen competition, electricity and gasoline. And I refer you with pride to the city in which you are meeting, gentlemen. Can you picture this town without any gas light? I can. For a few years ago you could not find any commercial lighting.

Stand any evening during your stay in Jacksonville, on any corner, and count the gas lighted properties. Have you seen any better demonstration of the possibilities of gas lighting than you are witnessing on your present visit? A personal visit to, and inquiry at the office of this progressive, well-managed Gas Company will convince you beyond a doubt that this has all been accomplished through gas and good maintenance. "Go thou and do likewise," Mr. Gas Man. Believe in your product, put sincere effort behind your convictions, and consumers will be won over every day.

Neither time nor space will permit the mentioning of all the good gas lighting in Dixie. Mr. Gas Man, there is no other form of lighting that can give your prospects or consumers so much for so little but do not cheapen your product by telling any prospective consumer how cheaply you can fill his needs. Tell him rather of the value of your product to him and of the kind of service you are giving. If your service can be spoken of to your consumers you can feel confident that it is the kind that wins every time. The public in the South does not differ from any other public. It is just as willing to pay for service as any community of citizens living anywhere. But the future of gas lighting in the South does not depend so much upon improved lighting appliances (for the manufacturers of lighting appliances have developed this branch of the gas industry to a very high efficiency) but it does depend upon the attitude of the combination company toward gas as an illuminant. Modern illumination, combining efficiency, economy and candle power, means GAS.

(To be Continued.)

Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, June 10, 1912.

The Institution of Gas Engineers.—The Centenary of the Gas Light and Coke Company.—A New Coking Test for Coal.

The annual meeting of the Institution of Gas Engineers is to be held in London next week, under the guidance of Mr. Robert G. Shadbolt, of Grantham, who has experienced an unusually busy year in the Presidential chair. Following the now established practice, the supply of papers for the proceedings is somewhat thin and meagre. Apart from reports of Committees, and some observations on examinations in gas engineering and supply, there are only four numbers, not a very great advance on the programme provided for a single sitting of a District Association, and one of these deals with the coking properties of coal, which is very interesting, but is only a side issue. So no one has anything to say about all the vicissitudes that we have experienced, and are experiencing in connection with the supply of coal, and several important matters that will have a very far reaching effect on the conditions of labor in gas works. I refer to the new Insurance Act, that comes into operation on the 15th prox., under which every workman must be insured against sickness, and certain classes against unemployment, and every employer is not only forced to pay stamp duty himself, but also to collect the same from the employee. This is only one of several topics of the day that might have found a place on the agenda.

The report issued by the Council is a lengthy document dealing with Membership, Awards for Papers, Reconstitution of the Institution, Affiliation, Examinations in Gas Engineering and Gas Supply, Education of Gasfitters, Library, Account, Publicity, General Purposes

Fund, Portrait of Mr. Thomas Newbigging, Proposed Gas Exhibition Next Year, Coal Smoke Abatement, Carbonization, Refractory Material, Gas Research Fellowship, Livesey Professorship, International Commission on Photometry, Standard Specification for Street Lighting, Alkali Manufacturers Opposition, Income Tax and Depreciation, National Insurance, and strike clauses. The membership has increased from 843 to 865 during the year, but the fact remains that the increase of membership is not commensurate with that of the industry, and that the number of managers of gas works not represented on the muster roll is greater than those that are. Approximately there are 2,000 to 2,500 gas works in the United Kingdom, and allowing for one manager taking charge of two or more small undertakings, there cannot be less than 2,000 managers. Yet the number of ordinary members is only 715. The student class of membership finds still less favor, the small number of 14 at the beginning of the year, having fallen to 11. Probably this is due to the formation of Junior Associations. Taken as a proposition of the total sale of gas or capital invested, the representation on the Institution would be very much larger, seeing that almost every large undertaking is represented. But it is difficult to understand why the membership is not at least 50 per cent. greater, and impossible to avoid the suspicion that a number of engineers are mean enough to share the advantages of the Institution by reading the published reports of proceedings in the current technical press, while doing nothing in the way of assistance or personal support. The committee on reconstitution do not recommend any alteration at present, seeing that the objects in view are being covered by the British Commercial Gas Association, and they propose giving the new venture ample time to justify its existence. The Commercial Association has made a vigorous start, an income of some £13,000 having been guaranteed, and already boasts an official organ. They have commenced advertisements in some of the leading papers and magazines of the day, and the same are of a high class character, free from the want of dignity and dismal attempts at humor that not infrequently disfigure the front page of a newspaper or magazine. They have also avoided the common mistake of indirectly advertising competitors by attempts to disparage or belittle them. The Jubilee of the Institution comes on next year, and it is proposed to celebrate it by a Grand Gas Exhibition in London. There may possibly be differences in opinion in respect to some of the actions taken by the Council, but there will be complete agreement about the proposal that one of the events next year shall be a presentation to Mr. Thomas Newbigging, one of the few surviving original members who has been in active harness during the whole of the 50 years, and whose public work in connection with our industry is so well known that it need not be further referred to. The only other item calling for particular notice is the reference to strike clauses. Although it has been the practice for years to insert a strike and accident clause in all coal contracts, the same has come to be regarded as a matter of form only, and the general custom is to enter upon contracts for the supply of gas for public lighting, or sale of residuals, without any provision of this sort. One great difficulty in connection with the recent coal strike was that the consumption of gas went up 10 or 15 per cent., with the result that companies well provided in respect to normal circumstances, were forced to go into the market and buy extra coal at famine prices, without any corresponding increase in the rates for gas and coke. Some thought to equalize matters by reducing the public light, but found that they were dependent for permission to do so upon the good graces of the local authority. While coal was scarce and dear, it was possible to increase the yard prices of coke, but almost every gas company had standing contracts with merchants and public institutions that had to be filled at the normal rate. After the experiences of last March, the need for the extension of the strike and accident clause to all contracts, written or implied, that extend over 3 months in advance, is obvious, and the Council will render good service to the industry if they devise a suitable standard clause.

There will be the usual meeting of the District Commercial Associations, a reception and dance at the invitation of the President and Mrs. Shadbolt, and a day excursion to Cambridge where visitors will have the choice of a visit to the Colleges, to the University Laboratories, or to the works of the Cambridge Gas Company.

The preliminary arrangements for the National Gas Exhibition to be held in October, 1913, are already in hand. A joint Committee representing the Council of the Institution and the Society of British Gas Industries, have secured the option of renting a series of halls at White City, at Shepherds Bush, and they require a guarantee fund of £10,000 over and above receipts for gate money, rent of space, etc., to make the thing a success. Subscribers to the guarantee fund will have the privilege of receiving admission tickets up to the value of their subscription. The difficulty in connection with these Exhibitions is that while they act as a general advertisement, the indirect advantage of all persons or companies interested in the sale of gas, the direct benefit as represented by the visits of consumers will be in inverse ratio to the distance from the show. Possibly 90 per cent. of the gas consumers residing within a radius of 10 miles from the White City will visit the Exhibition. But in the case of an undertaking 100 or 150 miles from the metropolis very few of the customers will be sufficiently interested to take a special journey, and the number of visitors from that district will be confined to a few individuals who usually happen to have other business in London. A very small proportion from Salisbury, for example, would attend, although it is only 80 miles and an hour and a half journey. The committee hope to be able to arrange an effective series of cooking demonstrations and competitions, and of popular and technical lectures.

Another interesting event this summer is the celebration of the centenary of the Gas Light & Coke Co., of London. Their charter was granted in April, 1812, but the corresponding month of the present year found them, in common with all other suppliers of gas, in the thick of the coal strike. The directors have therefore decided to wait something like a return to normal conditions, although they determined some months ago that the occasion should not pass without a fitting recognition. They have now decided that the directors and officers will dine together at the White City on the 26th inst., and that there shall be a grand gathering of employees and their wives at the Crystal Palace. Some sort of a history of the progress of events from the small beginning in 1812, to the present position, would be of great interest as practically being an account of the history of the development of the gas industry, and might appropriately be delivered as a lecture illustrated with views. The festivities will attract general attention amongst all gas workers, large or small, and best wishes for their entire success.

Talking of centenaries reminds one that it is just one hundred years since gas was first introduced into Germany, and that, as in England, it had to encounter a great deal of opposition, for the simple reason that it was a novelty, and likely to upset the established order of things, which of itself was regarded as necessarily objectionable. Now we have gone to the other end of the scale, and the greater the change likely to be caused by some new scheme, the greater the avidity with which it is adopted. One hundred years ago many people seemed to think it was "better to bear the ills we have than fly to others that we know not of." Now the idea is, anything for a change. It was urged that the introduction of gas would counteract the general order of nature that there should be darkness at night, an objection that applies to any kind of artificial light.

Apart from the effects of the products of combustion, the bright light would attract people in the streets and open air during the hours of darkness, to the prejudice of the general health. Drunkenness and immorality would be increased, and criminality and lawlessness encouraged. Now after 100 years experience it is safe to say that no one would care to return to the old conditions, that health and morality have been improved rather than otherwise, and that criminality has been largely reduced. Street robbery with violence has become an unheard of event, but one reason why our great grandfathers stayed indoors after dark was the risk of encountering highwaymen, footpads, garroters, etc. The advantages ushered in by gas have covered a far wider area than those of artificial light. The gas fire and the gas cooker have done much towards improving the atmosphere in our large towns. Something might also be said about the contributions from gas undertakings toward rates and taxes, the sum disbursed as wages each week at the works' office, and the numerous subsidiary trades and manufactures such as meters, stoves, tubing, retorts, etc. The gas works has also done as much in the cause of civilization and national prosperity as the railway.

Those who have occasion to make a proximate analysis of coal will be interested in a paper submitted to the London Section of the Society of Chemical Industry, by Dr. Lessing, suggesting a new apparatus for conducting the operation known as the volatile test. The usual method is the heating of a small quantity of the finely powdered sample in a platinum crucible with a loosely fitting lid, and with every care there is some difficulty in getting accurate and even results. The shape and size of the crucible, the size and flame temperature of the flame applied, as influencing the speed with which the mass of the sample is heated and the volatile matter liberated, all affect the ultimate result. Some of the fixed carbon may be burnt, or some of

the volatile matter may be decomposed. Some fine dust may be carried away with the current of gases, and it is possible to get a fairly consistent number of tests that agree together, not because they are correct, but because they all contain an equal element of error. Dr. Lessing proposes to substitute for the platinum crucible and Bunsen burner a set of flat bottomed cylindrical tubes, fitting loosely one within the other, which may be quartz glass or platinum, and a coil of platinum wire. The outer tube he calls the heating tube. Several turns of fine platinum wire are coiled round it, and it is embedded in an insulating material such as kieselguhr. The wire can be raised to a high temperature by means of an electric current, and an even strength ensuring a regular temperature can be maintained. The sample is contained in the second tube, and the third is used as a stopper being put close down on the top of the sample, in such a manner that there is no vacant space above the sample. It can, if desired, be loaded with quartz powder, so as to give a known compression on the sample. The new arrangement gives results that agree very closely with the American method, most of them within ½ per cent., and while useful as regards volatile matter, Dr. Lessing considers its chief advantage is a much more even and consistent result as regards the quality of the coke, and the facility for investigating the same. It is evident that the arrangement described might be substituted with advantage for the usual crucible, even if the Bunsen flame is retained, but that the electric current can be more closely controlled than any combustion process.

Management & Commercial Methods.

BALTIMORE'S WELCOMING FANCIES.—Of course, Baltimore was a busy place last week, when the delegates to the Democratic National Convention swarmed upon its ways and means. Also, of course, the "welcomers" included that well-managed corporation (the Consolidated Gas, Electric Light and Power Company), a feature of whose greeting consisted of a ready-for-action bird, that nobly stood out in bold relief on the front of the Company's massive building at Lexington and Liberty streets. This proud democratic gamester measured 20 feet, from the illuminated tips of his spurs to the crest of his

incandescent comb; and nearly 1,000 lamps were used in the outlining of his noble proportions. When in action (that is, when the current was "on"), he flapped his trusty right wing and winked his bright right eye. From his bill seemingly sprung, in electric letters, the words "Welcome to Baltimore." A metal background made this almost as attractive a sign during daylight as well as it was forceful at night. Many other decorations along this line were noteworthy, but the New Yorkers agreed that the Consolidated people's recognition was the most effective one shown.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,028,000. Attachment for Gas Retorts. S. E. De Frese, Chattanooga, Tenn.

1,028,044. Automatic Gas Cut-Off. R. A. Mack, Gallipolis, O.

1,028,105. Gas Saving Device. F. W. Ford, Minneapolis, Minn., assignor of one-third to R. B. McFerran and one-third to B. S. Hoar, same place.

1,028,145. Recording Apparatus for Measuring Gaseous Fluids. C. F. Simon, Stolberg, Germany.

1,028,146. Instantaneous Water Heater. W. F. Stewart, St. Louis, Mo.

1,028,366. Apparatus for Producing Hydrogen Gas. H. Lane, Birmingham, England, assignor to International Wasserstoff Aktiengesellschaft, Frankfort-on-the-Main, Germany.

1,028,388. Support for Incandescent Mantles. R. Roder, Mishawaka, Ind., assignor to V. E. Freeman, New York City.

1,028,419. Gas Purifier. C. H. Abbott, Lisbon, N. D.

1,028,524. Gas Producer. C. J. Atkinson, Milwaukee, Wis.

1,028,657. Device for Controlling from a Distance the Passage of Gas. A. M. Aubert and J. M. Aubert, Billiancourt, France.

1,028,666. Gas Heater, L. F. Betts, New York City, assignor to A. A. Low, Horseshoe, N. Y., and M. J. Wohl and H. Hertzberg.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. A. W. BORDEN, writing from Hastings, Neb., under date of the 20th inst., informs us that the Hastings (Neb.) Light and Heat Company has been reorganized under the title of the Hastings Gas Company. It has a paid-up capital of $50,000 preferred and $50,000 common, and the outstanding indebtedness is represented in an issue of $50,000, twenty-five year gold bonds, bearing 6 per cent. interest. The officers are: President, A. C. Fox; Vice-President and General Manager, A. W. Borden; Secretary and Treasurer, Edward Woodman; Assistant Treasurer, C. J. Hamot.

THE City Council, of Kendalville, Ind., has awarded to the Western Gas Construction Company, of Fort Wayne, Ind., a contract for the placing of 44 examples of the latter's ornamental street lamp-posts, to be used in extending the former's boulevard lighting system as shown on Main street. This type of posts is finding great favor all over the country.

MR. J. A. REILLY, well and widely known to the fraternity throughout the South and West, and the Middle West as well, from his membership in the Illinois and Indiana Gas Associations, and the fact that he has represented the Queen City Coal Company on the road for 14 years or so, has been elected Treasurer and General Manager of the Company.

THE Bethlehem (Pa) Consolidated Gas Company has applied to the authorities of the outlying settlement of Hellertown for the right to place its mains through the streets thereof. That would seem an appropriate name for some shady nook along the shores of the Hellespont!

MR. CHAS. F. WHEELER, proprietor of the Excelsior (Minn.) gas plant, has notified the authorities that, on and after to-day, the gas supply will be shut off. Cause therefor: The city has authorized another concern to operate an electric plant in Excelsior. There was not room for both industries, so said Mr. Wheeler.

THE proprietors of the Los Angeles (Cal.) Gas and Electric Corporation, operating in Los Angeles and vicinity, recently appeared before the California State Railroad Commission and asked consent to establish a new selling schedule, both as to gas and electric currents, to become operative July 1st. This was a sequel to the action recently of the Los Angeles Board of Public Utilities in giving reduced rates to those within the city limits. Concurrence would, therefore, mean equal rates within and without the city limits. The proposed concessions are: Gas to 75 cents, from 80 cents per 1,000; electrical currents, per kilowatt hour, to 6 cents from 7 cents.

THE Eastern Pennsylvania Power Company has practically assumed charge of the gas and electric supply of Nazareth, Pa., through acquiring control of the Nazareth Illuminating Gas Company and the Nazareth Electric Light and Power Company. Control was obtained through the purchase of the shares held by the estate of the late Conrad Muller.

THE Board of Gas and Electric Light Commissioners of Massachusetts has authorized the consolidation of the Union Electric Light Company, of Franklin, Mass., and the Foxboro (Mass.) Electric Company.

WE regret to have to chronicle the death of Mr. James Green, Assistant Superintendent of the Utica (N. Y.) Electric Light and Gas Company, who passed away on the morning of the 18th inst. He was born in Mechanicsville, N. Y., August 26, 1874, and had been a resi-

dent of Utica since 1901. He is survived by his parents, his wife and two daughters.

THE Municipal Gas Company, of Albany, N. Y., has purchased a tract of land on Broadway, adjoining the Company's plant on the south. Its dimensions are: Broadway, east side, 193 feet by 300 feet in depth. Mr. E. Palmer Gavit, the Company's Secretary and Treasurer, when asked as to the significance of the purchase, said the land had been acquired to provide for the future development of the Company, although at present no plans for extensions were in contemplation.

"L. V. T.," writing from Richmond, Va., under date of the 22d inst., forwards the following: "To supply the residents of Mason's Creek, Ocean View and Willoughby, a modern gas plant will shortly be erected by the proprietors of the Norfolk County (Va.) Gas Company, a charter for which was recently granted. The Company's officers are: President, W. H. Hofheiner; Vice-President, B. B. Ferguson; Secretary and Treasurer, J. M. Umstader.

MR. EDMUND CATHELS has resigned the position of Superintendent to the Marlboro-Hudson (Mass.) Gas Company, in order to take up a similar line of responsibility in the service of the Dover (N. H.) Company. His successor at Marlboro-Hudson is Mr. Edward F. Goggin, who has been connected with the Company as solicitor and business manager for quite a period.

ACCORDING to advices from Louisville, Ky., the merger of the Evansville (Ind.) Gas and Electric Company with the Evansville Public Service Company and the Evansville and Southern Indiana Traction Company, which latter two Companies were recently merged, has been satisfactorily completed. The new corporation will be known as the Public Utilities Company of Evansville, and will control all the gas, electric light, heat and power utilities as well as the street railway system in Evansville, in addition to an interurban line running from Evansville to Princeton. It will have an authorized issue of $10,000,000 of first and refunding bonds, $3,000,000 of preferred stock and $3,000,000 of common stock. Of the new securities $5,000,000 of bonds and $2,000,000 of preferred stock will be used to purchase underlying companies and to provide for the retirement of underlying bonds. All of the common stocks have been acquired by Hodenpyl, Hardy & Co., of New York, who will operate the properties. The Evansville Gas and Electric Company was controlled by the Hodenpyl, Hardy & Co. syndicate; the street railway system by the Murdock syndicate, of Lafayette, Ind., and the Public Service Company by the Charles Finley Smith syndicate of Evansville.

THE Board of Supervisors of Elizabeth City County, Va., has granted to the Newport News (Va.) Gas Company the right to extend its mains from the city limits to Riverview.

AGAIN are we told that Waycross, Ga., is to have a gas works. As it appears the franchise is asked for by out-of town capitalists, there may be some chance of the fruition of the planning this time; but the local authorities have heretofore acted, in respect of other applications for a like grant, quite like unto the action followed by the dog-in-the manger.

IT is reported that franchise privileges have been granted by the City Council, of Cordele, Ga., to the J. B. Crary Company, of Atlanta, Ga., to construct and operate a gas plant in Cordele, the life of the grant to be 20 years. The promoters agree to commence construction work within 6 months from July 1st, and agree to have the plant in readiness to supply gas 12 months thereafter. A tentative estimate respecting the investment involved puts the latter at $50,000. The promoters say they will go on with pipe laying right away in the business section of Cordele, at least in those streets which the city is proposing to repave.

AT the annual meeting of the Gas Club, Springfield (Mass.) Gas Light Company, over 100 members were present. The officers elected were: President, P. B. Bill; Vice-President, W. A. Bradley; Treasurer, A. S. Danforth; Secretary, V. L. Emig. Committees on House, Executive, Periodical, Question Box and Sickness were appointed. Following the business meeting a well-served collation was enjoyed.

"T. R. F.," writing from Raleigh, N. C., under date of the 22d June, says that the City Treasurer of Anderson, S. C.. has received from W. W. Hess and associates, of Germantown, Pa., their acceptance of the franchise to construct and operate a gas works recently granted by the Anderson City Council. The acceptance was forwarded with a certified check for $500, in the nature of a penalty. The money will be returned to the associates when they have expended the sum of $5,000 in plant construction. The agreement provides that construction work must be commenced within 6 months after acceptance, and that within 12 months thereafter the plant must be ready to furnish gas through at least 12 miles of mains. It is thought (in fact understood) that the "associates" will be actively on the job by July 10th.

"B. B. R.," in a short note from Boston, Mass., dated the 22d June, says that the authorities of Winthrop, Mass., have decisively negatived the project to engage in the gas and electric lighting business on municipal account. Further, the authorities were instructed to enter into another contract with the local concern supplying gas and electricity to Winthrop, for the public lighting for the ensuing year.

THE Board of Gas and Electric Light Commissioners, in a decision characterized by much criticism, has denied the petition of the Fall River (Mass.) Gas Works Company for permission to issue 1,150 shares of additional stock, at the rate of $225 per share, the proceeds to be devoted to paying for improvements made and contemplated on plant account.

Mr. A. S. CALDWELL, writing to us under date of the 24th inst., from Far Rockaway, L. I., says: "I fail to note any mention in the JOURNAL of the dispute that has been on for some time between the Queens Borough Gas and Electric Company and Mr. David H. Weyant, the rather odd-mannered individual who rules as President of the village of Cedarhurst, the matter of contention being the laying of gas mains in that pretty country side section. Where Weyant came in presumably in the case is beyond me, in fact is beyond many taxpayers in the district, who favor the Company's side of the case, merely from a commonsense point of view. The village recently passed an ordinance requiring that if any person or corporation tore up a street, he or it would be obliged to make a deposit assuring the village that the road would be put in the same condition as it was before the work was done. The result of the ordinance is that the Company, wishing to lay gas mains on several streets in Cedarhurst, refused to make the deposit, and President Weyant accordingly declined to grant the necessary permits. Mr. Weyant states that the money will be returned to the Company, provided the streets are not damaged; that is, all the money except the fee of $3 that will be deducted to pay an inspector to daily look over the work. In reply to President Weyant's statement the Company said that it did not object to paying the inspector's fee, but it did not wish to establish a precedent of this kind in villages on Long Island, where it supplies light. It is claimed that the Company is reliable, and that if the roads are damaged the Company can be compelled to repair them. As President Weyant did not view the matter in this light, the Company has applied for a writ of mandamus in the Supreme Court to compel him to grant the permit."

MR. F. L. CROSS, General Manager of the Madison (Wis.) Gas and Electric Company, is constructing a new water gas building, and has authorized The Gas Machinery Company, of Cleveland, O., to place therein an 8-foot 6-inch set of apparatus of its well-known approved type.

A SPECIALTY that the Mueller Mfg. Co., of Decatur, Ills., and N.Y., is featuring just now is "The Mueller Extension Box;" also, "The Mueller Repair Lids." The latter device is quite a scheme on savings' account.

"T. M. R.," writing from Fresno, Cal., under date of the 18th inst., informs us that, pursuant to a decision by the California Supreme Court in the case of the Hanford Gas and Power Company *vs.* the city of Hanford, the State law relative to the collection of percentage on receipts of gas and water companies by cities wherein they operate under franchises providing for such percentages, has been tested. and the Hanford Gas and Power Company will have to pay 2 per cent. of its gross receipts to the city of Hanford covering a period of 4 years past, and furthermore will have to pay it perpetually during the remainder of the 41 years of life of the 50-year franchise which the Gas Company holds.

The Market for Gas Securities.

Again have we to chronicle a week of inactivity, although there were some manifestation that strength was more in evidence than the reverse. However, there is not much to shout over respecting the net increase as between noon of last Friday and noon of today (28th). It figures just ¼ point in the bid price. However, 'tis a beginning.

Brooklyn Union is betwixt and between, in that holders seem doubtful as to the wisdom of selling, and purchasers exhibit a like state of mind. However, the decidedly wrong thing to do would be to sell, for the development of this Company's suburban business is really surprising. Out-of-town shares are dull, although prices in them are fairly steady.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

JULY 1.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	142¼	142⅜
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	108	105
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,600,000	100	165	175
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98¼	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	102
Standard	5,000,000	100	69	70
Preferred	5,000,000	100	99	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	141½	143
1st Con. 5's, due 1948, M. & N.	15,000,000	—	105¾	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	⅛	⅝
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084	—		—
Mortgages, 5's	3,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore				
City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,580,000	—	—	50
Detroit Gas Co., 5's	381,000	1,000	75	80
" Prior Lien 5's	5,619,000	1,000	97	100¼
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	-
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	130	138
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	—	38
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	99	102
Laclede Gas Co., St. Louis.	10,000,000	100	105½	106
Preferred	2,500,006	100	90	91½
Bonds	10,000,000	1,000	102¾	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	108¾
Massachusetts Gas Compan-				
ies, of Boston	25,000,000	100	90¾	95¾
Preferred	25,000,000	100	95½	96
Montreal Gas Co., Canada	2,000,000	100	208	210
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	182	190
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	113½	114
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105¼
Pacific Gas and Electric Co.	15,500,000	—	64½	65½
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	430	435
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Marlborough-Blenheim Hotel, Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting and Gas Show, Toronto, Aug. 26th to Sept. 7, 1912. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Monthly meetings. Chairman, Will W. Barnes; Commissioners, W. H. Pettes, I. W. Peffy; Secretary, H. Thurston Owens, 42 Pine street, New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 19th and 20th, 1913. Chicago, Ills. Officers: President, H. O. Channon, Quincy, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, Niagara Falls, Canada, Sept. 16-19, 1912. Meetings of Sections, monthly. Pres't, V. R. Lansingh, New York City; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Burlington, Ia., May, 1913; Officers: President, C. W. Fair, Atlantic, Ia.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October 17-19. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association.—Annual meeting, September 4-6, 1912; Toronto, Canada Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Joplin, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and Gas Show, Dec. 2-5, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, Cleveland, O., May, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, ——— 1913. Boston. Officers: President, D. D. Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Summer Meeting, August 24, Atlantic City, N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, May, 1913. President, Noel R. Gascho, Alva, Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, San Diego, Cal., September 17, 18, 19, 1912. Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice-President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, York, Pa., April, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 13, 1912; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, April ——— 1913, Charlotte, N. C. Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting, April ——— 1913, Galveston, Tex. Officers: President, F. M. Lege, Jr., Galveston, Tex.; Secretary, H. S. Cooper, Galveston, Tex.

Wisconsin Gas Association.—Annual meeting, May ——— 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.